CATALOG 30

BAKER ICE MACHINE CO.

AMMONIA FITTINGS AND SUPPLIES

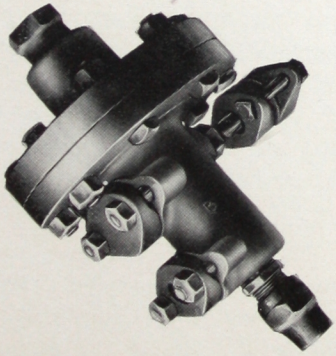
OMAHA
NEBRASKA
:U. S. A:

ISSUED BY THE

BAKER ICE MACHINE COMPANY

MANUFACTURERS OF

ICE MAKING AND REFRIGERATING MACHINERY



[OUR PATENT AUTOMATIC EXPANSION VALVE]
See Page Forty for Description]

DESIGNERS OF

COLD STORAGE AND ICE MAKING PLANTS

GENERAL OFFICES AND FACTORY

1901-1929 NICHOLAS STREET, OMAHA, NEB., U. S. A.

INTRODUCTORY

WE are pleased to present herewith catalog of our Standard Type of Ammonia Fittings, Valves, etc., which we manufacture. Owing to the phenomenal growth of our Fitting business, we have been compelled to greatly increase our special tools and equipment, and are now in better position than ever to turn out our high grade Ammonia Fittings and Valves and to meet the requirements of our customers.

Several of our Special Ammonia Fittings have been patented, the patents being controlled exclusively by us, and we particularly call attention to our Special Double Pipe Condenser and Double Pipe Brine Cooler Fittings, also to our Patented Automatic Expansion Valve, all of which are being so generally adopted by the trade, and details of which you will find explained elsewhere in this catalog.

We appreciate the many courtesies shown us by our patrons in the past, and shall endeavor to warrant a continuance of same, and to ensure the support of all others who may favor us with their orders, by supplying them with high grade Ammonia Fittings at as low prices as are consistent with good material and high class workmanship.

Special Notice Page 32

Baker Ice Machine Company
Omaha, Nebraska
U. S. A.

Patents Owned and Controlled Exclusively by Us

Our Compressor Valves have a distinct individuality and are thoroughly covered by patents. They are unequaled for their long life, noiseless operation, and general safety features, and the workmanship and material are of the very highest grade. See page 43.

Our Double Pipe Condenser Fittings and *Water Return Bends* are patented, and ours is the only bend which is held in place by a single bolt. It is simple to remove and makes the cleaning out of a double pipe condenser extremely simple. There are no screw joints exposed to the ammonia pressure, and every pipe can be readily removed without disturbing any other pipe in the condenser. See page 44.

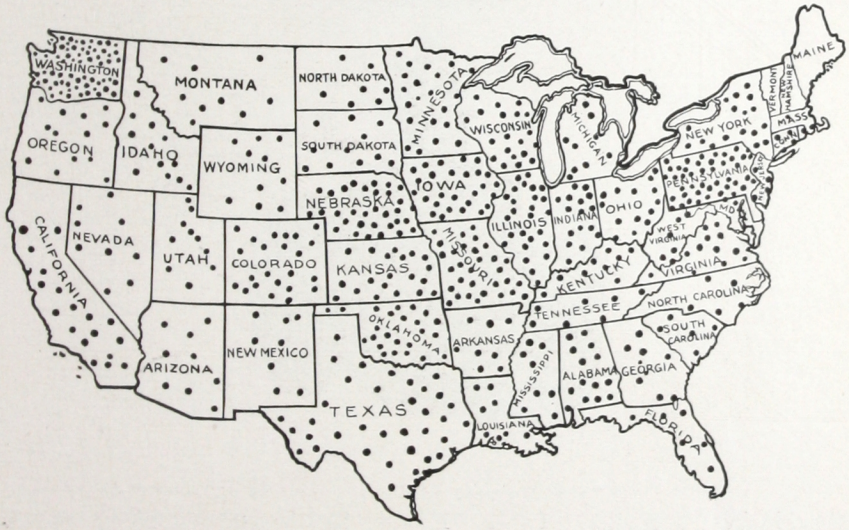
Our Patent Double Pipe Flooded Type Brine Cooler has all the advantages of the flooded system and none of the disadvantages. Our apparatus is at all times under the eye of the operator, while other flooded systems are submerged in a tank of brine beyond the control or sight of the party operating the plant. The increase in the capacity of the machine with our flooded system is very marked. See page 27.

Our Patent Triplex Water Cooler is for reducing the temperature of water for bottlers' use or for drinking water, or any other purpose where quick and positive action is required. This cooler takes up less space and is simpler and more economical than any other on the market today. See page 36.

Our Patent Automatic Expansion Valve is for the purpose of regulating the pressure of the expanding ammonia gas in cold storage and ice making plants, and in regulating the pressure it thereby regulates the temperatures. See page 40.

The Largest Factory in the United States Devoted Exclusively to the Manufacturing of Medium Sized Refrigerating and Ice Making Machines.

A Continuous Cold Wave From Shore to Shore Produced With Baker Ice and Refrigerating Machinery



Each dot represents one of our Refrigerating Plants doing actual work in the United States.

We have also many in foreign countries.

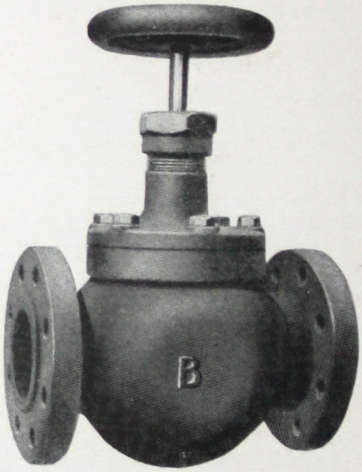
Some of our patented features exclusively controlled by us: Automatic Expansion Valve, Compressor Valves, Double Pipe Ammonia Condenser Fittings, Double Pipe Flooded Type Brine Cooler, and Triplex Water Cooler.

We have separate illustrated bulletins showing the construction of plants for confectioners, ice cream and cheese makers, creameries, grocers, butchers, fish and oyster dealers, bakeries, fur storage, produce and fruit storage, hotels, cafes, etc.

Also water cooling bulletins of plants for bottlers, factories, apartment houses, offices and other large buildings. We would be pleased to mail you either, that you may be particularly interested in.

We manufacture all sizes of ice making and refrigerating machinery up to fifty tons daily capacity, for all purposes, either of the "brine circulation" or "direct expansion" systems.

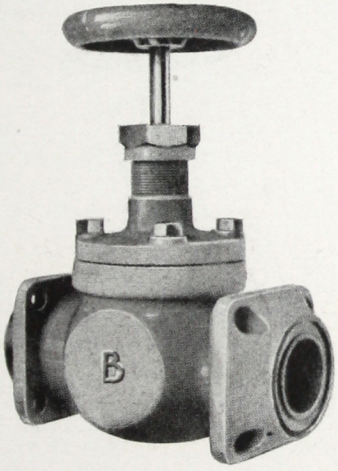
Round Flange Ammonia Globe Valve



Size, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Number	590	588	587	586	585	763
Face to face of flanges	$7\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	12	12
Outside diameter of flanges	$4\frac{1}{2}$	5	$5\frac{7}{8}$	$5\frac{7}{8}$	$7\frac{1}{8}$	$7\frac{7}{8}$
Diameter of bolt circle	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{4}$	$6\frac{1}{4}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x $2\frac{3}{4}$	$\frac{5}{8}$ x $2\frac{3}{4}$	$\frac{3}{4}$ x $3\frac{1}{2}$	$\frac{3}{4}$ x $3\frac{1}{2}$
Number of bolts	4	4	4	4	6	6
Price without companion flanges, bolts or gaskets	$16.00	$18.00	$21.50	$27.00	$31.50	$36.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

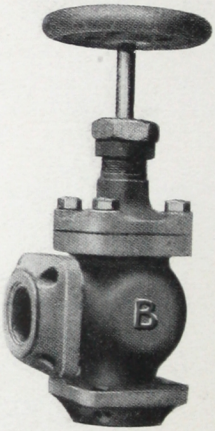
Square Flange Ammonia Globe Valve



Size, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Number	591	570	592	576	593	594
Face to face of flanges	$6\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	12	12
Outside size of flange	$3\frac{5}{8}$	$3\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{5}{8}$	$6\frac{1}{8}$
Center of bolts	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$	4	$4\frac{1}{8}$
Size of bolts	$\frac{1}{2}$ x $2\frac{3}{4}$	$\frac{1}{2}$ x $2\frac{3}{4}$	$\frac{5}{8}$ x $3\frac{1}{2}$	$\frac{5}{8}$ x $3\frac{1}{2}$	$\frac{3}{4}$ x $4\frac{1}{2}$	$\frac{3}{4}$ x $4\frac{1}{2}$
Number of bolts	4	4	4	4	4	4
Price without companion flanges, bolts or gaskets	$10.00	$15.00	$16.00	$19.00	$28.50	$36.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

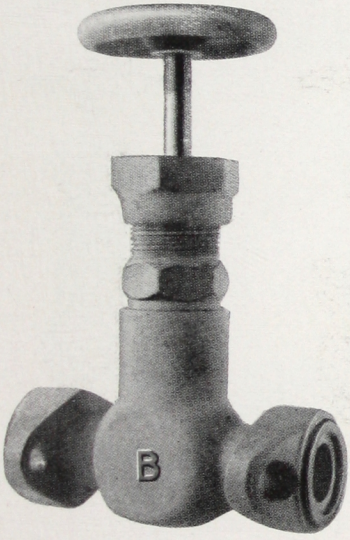
Square Flange Ammonia Angle Valve



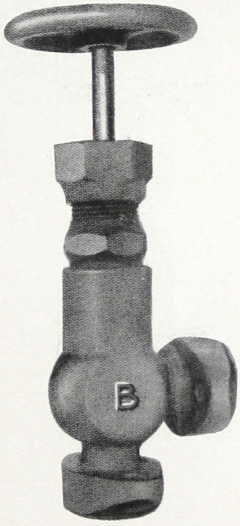
Size, inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Number	595	575	596	581	597	598
Center to face of flanges	$3\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	6	6
Outside size of flanges	$3\frac{5}{8}$	$3\frac{5}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{5}{8}$	$6\frac{1}{8}$
Center of bolts	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{16}$	$3\frac{1}{16}$	4	$4\frac{1}{8}$
Size of bolts	$\frac{1}{2}$ x $2\frac{3}{4}$	$\frac{1}{2}$ x $2\frac{3}{4}$	$\frac{5}{8}$ x $3\frac{1}{2}$	$\frac{5}{8}$ x $3\frac{1}{2}$	$\frac{3}{4}$ x $4\frac{1}{2}$	$\frac{3}{4}$ x $4\frac{1}{2}$
Number of bolts	4	4	4	4	4	4
Price without companion flanges, bolts or gaskets	$10.00	$15.00	$16.00	$19.00	$28.50	$36.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Oval Flange Ammonia Valves



GLOBE



ANGLE

Globe

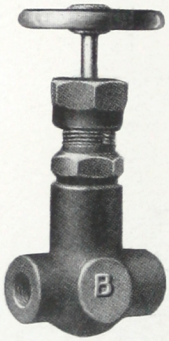
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Number	751	752	753	754	755	756
Face to face of flanges	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	7	$7\frac{1}{2}$
Outside size of flange	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$	$4\frac{7}{8}$
Center of bolts	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{5}{16}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x $3\frac{1}{4}$
Number of bolts	2	2	2	2	2	2
Price without companion flanges, bolts or gaskets	$6.00	$6.50	$7.00	$8.00	$9.00	$12.00

Angle

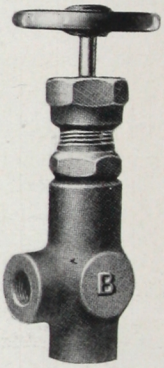
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Number	757	758	759	760	761	762
Center to face of flanges	$2\frac{3}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{3}{4}$
Outside size of flange	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$	$4\frac{7}{8}$
Center of bolts	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{5}{16}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x $3\frac{1}{4}$
Number of bolts	2	2	2	2	2	2
Price without companion flanges, bolts or gaskets	$6.00	$6.50	$7.00	$8.00	$9.00	$12.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Screw End Ammonia Valves



GLOBE



ANGLE

Globe

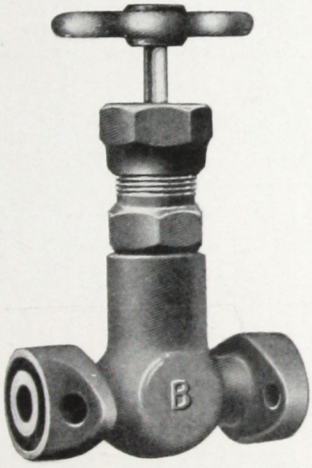
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Number	550	764	556	765	766	767	768	769
Face to face	$3\frac{1}{4}$	4	4	$4\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{3}{4}$	6	7
Price	$3.50	$4.50	$5.00	$5.50	$6.00	$7.50	$9.00	$12.00

Angle

Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Number	770	771	555	772	773	774	775	776
Center to face	$1\frac{5}{8}$	2	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{7}{8}$	3	$3\frac{1}{2}$
Price	$3.50	$4.50	$5.00	$5.50	$6.00	$7.50	$9.00	$12.00

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Oval Flange Ammonia Expansion Valve



GLOBE

Globe

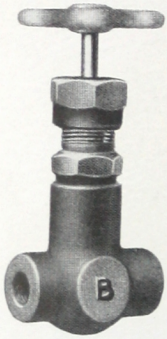
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number	788	789	790	791	792
Face to face of flanges	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	7
Outside size of flanges	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$
Center of bolts	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x 3
Number of bolts	2	2	2	2	2
Price without companion flanges, bolts or gaskets	$6.00	$6.50	$7.00	$8.00	$9.00

Angle

Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number	793	794	795	796	797
Center to face of flange	$2\frac{3}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$
Outside size of flanges	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$
Center of bolts	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x 3
Number of bolts	2	2	2	2	2
Price without companion flanges, bolts or gaskets	$6.00	$6.50	$7.00	$8.00	$9.00

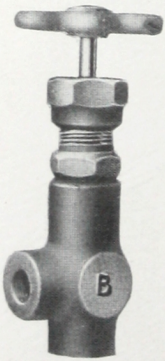
In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Screw End Expansion Valves



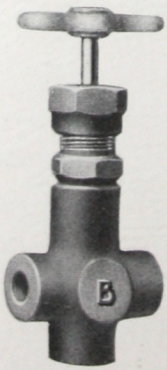
Globe

Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number	798	799	1200	1201	1202
Face to face	$3\frac{1}{4}$	4	4	$4\frac{1}{4}$	$4\frac{1}{2}$
Price	$3.50	$4.50	$5.00	$5.50	$6.00



Angle

Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number	1203	1204	1205	1206	1207
Center to face	$1\frac{5}{8}$	2	2	$2\frac{1}{8}$	$2\frac{1}{4}$
Price	$3.50	$4.50	$5.00	$5.50	$6.00

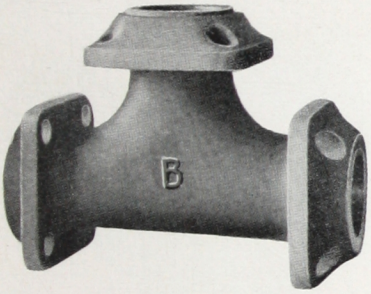


Tee

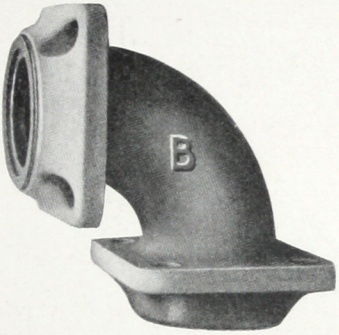
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$	1	1 x 1 x $\frac{1}{2}$
Number	1208	1209	1210	1211	1212	1213	1214
Center to face	$1\frac{5}{8}$	2	2	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{4}$
Price	$4.75	$6.00	$6.50	$7.00	$7.00	$8.00	$8.00

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Square Flanged Ammonia Fittings



TEE



ELBOW

Tee

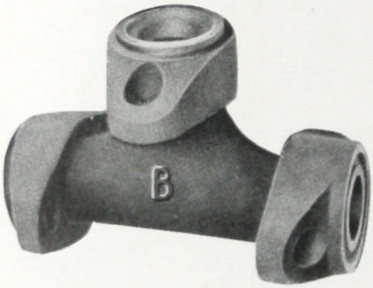
Size	RUN						OUTLET					
	Number	Length Face to Face	Outside Size of Flange	Center of Bolts	Size of Bolts	No. of Bolts	Center to Face	Outside Size of Flange	Center of Bolts	Size of Bolts	No. of Bolts	Price less Companion Flanges, Bolts and Gaskets
1 x 1	1215	6½	3 5/8	2 3/8	½ x 2¾	4	3¼	3½	2 3/8	½ x 2¾	4	$ 3.00
1¼ x ½	1216	6½	3 5/8	2 3/8	½ x 2¾	4	3¼	3½	2 3/8	½ x 2¾	4	3.75
1¼ x 1¼	673	6½	3 5/8	2 3/8	½ x 2¾	4	3¼	3½	2 3/8	½ x 2¾	4	3.75
1¼ x 2	1217	8½	4	2 5/8	5/8 x 3¼	4	4¼	4½	3 1/16	5/8 x 3½	4	3.75
1½ x ½	1218	8½	4	2 5/8	5/8 x 3¼	4	4¼	3¾ ov.	2 5/8	½ x 2½	2	3.75
1½ x 1	1219	8½	4	2 5/8	5/8 x 3¼	4	3½	2 5/8	2¼	5/8 x 3	4	3.75
1½ x 1½	1220	8½	4	2 5/8	5/8 x 3¼	4	4¼	4	2 5/8	5/8 x 3¼	4	3.75
1½ x 2	1221	8½	4	2 5/8	5/8 x 3¼	4	4¼	4½	3 1/16	5/8 x 3½	4	3.75
2 x ½	1222	8½	4½	3 1/16	5/8 x 3½	4	4¼	3¾ ov.	2 5/8	½ x 2½	2	4.00
2 x 1	1223	8½	4½	3 1/16	5/8 x 3½	4	4¼	4½ ov.	3 1/16	5/8 x 3	2	4.00
2 x 1¼	1224	8½	4½	3 1/16	5/8 x 3½	4	4¼	4	2 5/8	5/8 x 3¼	4	4.00
2 x 1½	1225	8½	4½	3 1/16	5/8 x 3½	4	4¼	4	2 5/8	5/8 x 3¼	4	4.00
2 x 2	1226	8½	4½	3 1/16	5/8 x 3½	4	4¼	4½	3 1/16	5/8 x 3½	4	4.00
2 x 2½	1227	8½	4½	3 1/16	5/8 x 3½	4	6	5 5/8	4	¾ x 4½	4	5.50
2 x 3	1228	8½	4½	3 1/16	5/8 x 3½	4	6	6 1/8	4 1/8	¾ x 4½	4	6.50
2½ x 1½	1229	8½	5 5/8	4	¾ x 4½	4	6	4	2 5/8	5/8 x 3¼	4	6.75
2½ x 1¼	1230	12	5 5/8	4	¾ x 4½	4	6	4	2 5/8	5/8 x 3¼	4	7.00
2½ x 1½	1231	12	5 5/8	4	¾ x 4½	4	6	4	2 5/8	5/8 x 3¼	4	7.00
2½ x 2	1232	12	5 5/8	4	¾ x 4½	4	6	4½	3 1/16	5/8 x 3½	4	7.25
2½ x 2½	1233	12	5 5/8	4	¾ x 4½	4	6	5 5/8	4	¾ x 4½	4	8.00
2½ x 3	1234	12	5 5/8	4	¾ x 4½	4	6	6 1/8	4 1/8	¾ x 4½	4	9.50
3 x 2	1235	12	6 1/8	4 1/8	¾ x 4½	4	6	4½	3 1/16	5/8 x 3½	4	9.50
3 x 2½	1236	12	6 1/8	4 1/8	¾ x 4½	4	6	5 5/8	4	¾ x 4½	4	10.00
3 x 3	1237	12	6 1/8	4 1/8	¾ x 4½	4	6	6 1/8	4 1/8	¾ x 4½	4	10.50

Elbow

Size Inches	1	1¼	1½	2	2½	3
Number	1279	672	1280	1281	1282	1283
Center to face of flange	3¼	3¼	4¼	4¼	6	6
Outside size of flange	3 5/8	3 5/8	4	4½	5 5/8	6 1/8
Center of bolts	2 3/8	2 3/8	2 5/8	3 1/16	4	4 1/8
Size of bolts	½ x 2¾	½ x 2¾	5/8 x 3¼	5/8 x 3½	¾ x 4½	¾ x 4½
Number of bolts	4	4	4	4	4	4
Price less companion flanges, bolts and gaskets	$2.00	$2.25	$2.50	$3.00	$5.50	$7.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Oval Flanged Ammonia Fittings



TEE

ELBOW

Tee

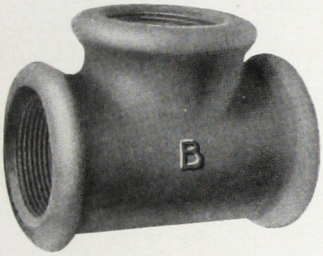
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number	1238	1239	1240	1241	1242
Center to face of flange	$2\frac{3}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$
Outside size of flange	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$
Center of bolts	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x 3
Number of bolts	2	2	2	2	2
Price less companion flanges, bolts or gaskets	$1.50	$1.75	$1.75	$2.00	$2.50

Elbow

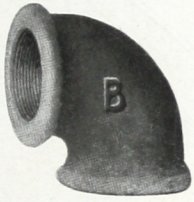
Size, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Number	1284	1285	1286	1287	1288
Center to face of flange	$2\frac{3}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{2}$
Outside size of flange	$3\frac{1}{2}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{1}{2}$
Center of bolts	$2\frac{1}{4}$	$2\frac{5}{8}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$
Size of bolts	$\frac{1}{2}$ x $2\frac{1}{4}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{1}{2}$ x $2\frac{1}{2}$	$\frac{5}{8}$ x 3	$\frac{5}{8}$ x 3
Number of bolts	2	2	2	2	2
Price less companion flanges, bolts or gaskets	$1.00	$1.25	$1.50	$1.75	$2.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Screw End Ammonia Fittings



TEE



ELBOW

Tee

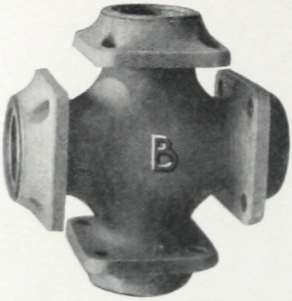
Size Inches	Number	Center to Face	Price
$\frac{1}{4}$	1243	1	$0.55
$\frac{3}{8}$	1244	$1\frac{1}{8}$	.65
$\frac{1}{2}$	1245	$1\frac{5}{16}$	.80
$\frac{3}{4}$	1246	$1\frac{1}{2}$	.90
1	1247	$1\frac{13}{16}$	1.10
$1\frac{1}{4}$	1248	$2\frac{1}{8}$	1.45
$1\frac{1}{2}$	1249	$2\frac{1}{2}$	1.90
2	1250	$2\frac{7}{8}$	2.45
$2\frac{1}{2}$	1251	$3\frac{1}{4}$	4.00
3	1252	$3\frac{5}{8}$	5.50

Elbow

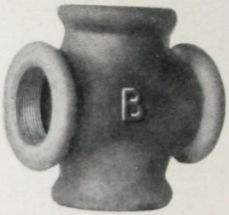
Size Inches	Number	Center to Face	Price
$\frac{1}{4}$	1289	1	$0.35
$\frac{3}{8}$	1290	$1\frac{1}{8}$	.45
$\frac{1}{2}$	1291	$1\frac{5}{16}$	.55
$\frac{3}{4}$	1292	$1\frac{1}{2}$	.65
1	1293	$1\frac{13}{16}$	.75
$1\frac{1}{4}$	1294	$2\frac{1}{8}$	1.00
$1\frac{1}{2}$	1295	$2\frac{1}{2}$	1.25
2	1296	$2\frac{7}{8}$	1.60
$2\frac{1}{2}$	1297	$3\frac{1}{4}$	2.75
3	1298	$3\frac{5}{8}$	3.70

In ordering, specify size and number and "HOW TO SHIP." Write for Discounts.

Ammonia Crosses



SQUARE FLANGED



SCREW END

Square Flanged

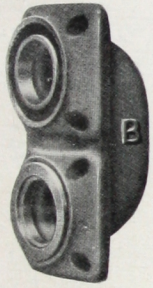
SIZE	Number	RUN					OUTLET					Price less Companion Flanges, Bolts and Gaskets
		Length Face to Face	Outside Size of Flange	Center of Bolts	Size of Bolts	No. of Bolts	Length Face to Face	Outside Size of Flange	Center of Bolts	Size of Bolts	No. of Bolts	
1 x 1	1253	7	3 5/8	2 1/4	5/8 x 3	4	7	3 5/8	2 1/4	5/8 x 3	4	$ 4.50
1 1/4 x 1 1/4	1254	8 1/2	4	2 5/8	5/8 x 3 1/4	4	8 1/2	4	2 5/8	5/8 x 3 1/4	4	5.00
1 1/2 x 1 1/2	1255	8 1/2	4	2 5/8	5/8 x 3 1/4	4	8 1/2	4	2 5/8	5/8 x 3 1/4	4	5.00
2 x 1 1/4	1256	8 1/2	4 1/2	3 1/16	5/8 x 3 1/2	4	8 1/2	4	2 5/8	5/8 x 3 1/2	4	6.00
2 x 1 1/2	1257	8 1/2	4 1/2	3 1/16	5/8 x 3 1/2	4	8 1/2	4	2 5/8	5/8 x 3 1/4	4	6.00
2 x 2	1258	8 1/2	4 1/2	3 1/16	5/8 x 3 1/2	4	8 1/2	4 1/2	3 1/16	5/8 x 3 1/2	4	6.00
2 1/2 x 2	1259	12	5 5/8	4	3/4 x 4 1/2	4	12	4 1/2	3 1/16	5/8 x 3 1/2	4	9.00
2 1/2 x 2 1/2	1260	12	5 5/8	4	3/4 x 4 1/2	4	12	5 5/8	4	3/4 x 4 1/2	4	10.00
3 x 2	1261	12	6 1/8	4 1/8	3/4 x 4 1/2	4	12	4 1/2	3 1/16	5/8 x 3 1/2	4	11.00
3 x 2 1/2	1262	12	6 1/8	4 1/8	3/4 x 4 1/2	4	12	5 5/8	4	3/4 x 4 1/2	4	11.50
3 x 3	1263	12	6 1/8	4 1/8	3/4 x 4 1/2	4	12	6 1/8	4 1/8	3/4 x 4 1/2	4	12.00

Screw End

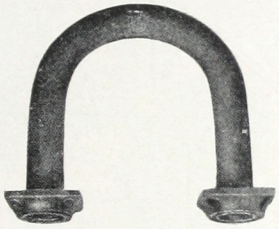
Size Inches	Number	Face to Face	Price
1/4	1269	2	$0.75
3/8	1270	2 1/4	.90
1/2	1271	2 5/8	1.10
3/4	1272	3	1.25
1	1273	3 5/8	1.50
1 1/4	1274	4 1/4	2.00
1 1/2	1275	5	2.60
2	1276	5 3/4	3.35
2 1/2	1277	6 1/2	5.00
3	1278	7 1/4	7.00

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Square Flanged Ammonia Return Bends



SEMI-STEEL



WROUGHT IRON

Wrought Iron

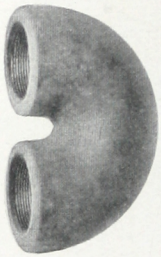
Size pipe, inches	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	2	2	2
Center to center	$4\frac{1}{2}$	6	$4\frac{1}{2}$	6	8	10	8	10	12
Center bend to end pipe	9	9	10	$10\frac{1}{2}$	11	12	$13\frac{1}{2}$	15	12
Number	1414	1416	1418	1419	1420	1421	1422	1423	1424
Price with flanges	$2.55	$2.80	$2.90	$3.00	$3.25	$3.50	$4.75	$5.00	$5.25

Semi-Steel

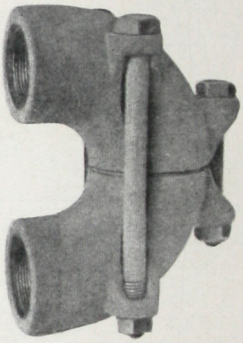
Size Inches	Number	Center to Center	Outside Size of Flange	Center of Bolts	Size of Bolts	No. of Bolts	Price less Companion Flanges, Bolts or Gaskets
$1\frac{1}{4}$	1425	$3\frac{3}{8}$	$4\frac{7}{8}$ x $2\frac{5}{8}$	$3\frac{5}{16}$	$\frac{5}{8}$ x $3\frac{1}{4}$	2	$1.70
$1\frac{1}{4}$	1426	4	$4\frac{7}{8}$ x $2\frac{5}{8}$	$3\frac{5}{16}$	$\frac{5}{8}$ x $3\frac{1}{4}$	2	1.90
$1\frac{1}{4}$	1427	$4\frac{1}{2}$	$4\frac{7}{8}$ x $2\frac{5}{8}$	$3\frac{5}{16}$	$\frac{5}{8}$ x $3\frac{1}{4}$	2	2.10
$1\frac{1}{4}$	1428	6	$4\frac{7}{8}$ x $2\frac{5}{8}$	$3\frac{5}{16}$	$\frac{5}{8}$ x $3\frac{1}{4}$	2	2.40
$1\frac{1}{4}$	671	$4\frac{1}{2}$	$3\frac{5}{8}$	$2\frac{3}{8}$	$\frac{1}{2}$ x $2\frac{3}{4}$	4	2.50
$1\frac{1}{4}$	670	6	$3\frac{5}{8}$	$2\frac{3}{8}$	$\frac{1}{2}$ x $2\frac{3}{4}$	4	2.70
$1\frac{1}{2}$	1429	6	4	$2\frac{5}{8}$	$\frac{5}{8}$ x $3\frac{1}{4}$	4	2.80
$1\frac{1}{2}$	1430	8	4	$2\frac{5}{8}$	$\frac{5}{8}$ x $3\frac{1}{4}$	4	3.10
2	1431	$4\frac{5}{8}$	$4\frac{1}{2}$	$3\frac{1}{16}$	$\frac{5}{8}$ x $3\frac{1}{4}$	4	2.15
2	1432	6	$4\frac{1}{2}$	$3\frac{1}{16}$	$\frac{5}{8}$ x $3\frac{1}{2}$	4	2.35
2	1433	8	$4\frac{1}{2}$	$3\frac{1}{16}$	$\frac{5}{8}$ x $3\frac{1}{2}$	4	2.75
2	1434	10	$4\frac{1}{2}$	$3\frac{1}{16}$	$\frac{5}{8}$ x $3\frac{1}{2}$	4	3.50
2	1435	12	$4\frac{1}{2}$	$3\frac{1}{16}$	$\frac{5}{8}$ x $3\frac{1}{2}$	4	4.25

In ordering, specify size and number; also if wanted with companion flanges and "HOW TO SHIP." Write for Discounts.

Screw End Ammonia Return Bends



SOLID



SPLIT

Solid

Size, Inches	1	1	1	1	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½	1½	1½
Number	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449
Centers	1¾	2½	4	6	2½	3	4	5	6	8	2¾	3	4	6
Price	$0.65	$0.80	$0.95	$1.15	$0.85	$0.90	$1.10	$1.20	$1.30	$1.50	$1.35	$1.40	$1.50	$1.75

Size, Inches	1½	2	2	2	2	2	2	2	2	Single Bolt Water	1¼	1¼
Number	1450	1451	1452	1453	1454	1455	1456	1457	1458		674	1463
Centers	8	3¼	3½	3¾	4	4¾	6	8	10		4	6
Price	$2.00	$1.70	$1.80	$1.90	$2.00	$2.25	$2.50	$3.25	$3.75		$1.30	$1.50

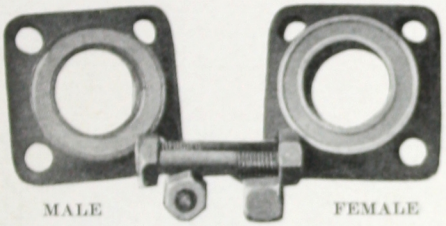
Split

Size, Inches	1	1	1	1¼	1¼	1½	1½	2
Number	1459	1460	1461	1462	1464	1466	1467	1468
Centers	2½	4	6	3	5	4	6	3¼
No. of Bolts	2	2	2	3	3	3	3	3
Size Bolts	½	½	½	½	½	½	½	⅝
Price	$1.20	$1.25	$1.30	$1.40	$1.80	$2.25	$2.60	$2.60

Size, Inches	2	2	2	2	2
Number	1469	680	1471	1472	1473
Centers	3½	3¾	4	4¾	6
No. of Bolts	3	4	3	3	3
Size Bolts	⅝	⅝	⅝	⅝	⅝
Price	$2.70	$2.80	$2.90	$3.25	$3.75

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Ammonia Flanges



MALE FEMALE

Square

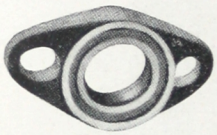
Size of Pipe Inches	Number of Male Flange	Number of Female Flange	Outside Size of Flange	Center of Bolts	Size of Bolts	Number of Bolts	Price each, less Bolts and Gasket	Price Per Pair, with Bolts and Gasket
¼	620	1474	3	1⅞	½ x 2¼	4	$0.60	$1.60
¾	1342	1343	3⅜	2¼	⅝ x 2¾	4	.70	1.90
¾	1344	1345	4	2⅝	⅝ x 3	4	.85	2.20
¾	1346	1347	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
⅜	618	1349	3	1⅞	½ x 2¼	4	.60	1.60
⅜	1348	1351	3⅜	2¼	¾ x 2¾	4	.70	1.90
⅜	1350	1353	4	2⅝	¾ x 3	4	.85	2.20
⅜	1352	1355	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
½	616	1357	3	1⅞	½ x 2¼	4	.60	1.60
½	1354	1359	3⅜	2¼	⅝ x 2¾	4	.70	1.90
½	1356	1361	4	2⅝	⅝ x 3	4	.85	2.20
½	1358	1363	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
¾	614	1365	3⅜	2¼	⅝ x 2¾	4	.70	1.90
¾	1360	1367	4	2⅝	⅝ x 3	4	.85	2.20
¾	1362	1369	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
1	612	1371	3⅜	2¼	½ x 2¾	4	.70	1.90
1	1364	1373	4	2⅝	⅝ x 3	4	.85	2.20
1	1366	1375	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
1¼	610	1377	3⅜	2¼	½ x 2¾	4	.85	2.20
1¼	1368	1379	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
1¼	1370	1381	5⅜	4	¾ x 4½	4	2.00	5.00
1½	608	1383	4½	3 1/16	⅝ x 3¼	4	.85	2.20
1½	1372	1385	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
1½	1374	1387	5⅜	4	¾ x 4½	4	2.00	5.00
2	606	1389	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
2	1376	1391	5⅜	4	¾ x 4½	4	2.00	5.00
2	1378	1393	6⅛	4½	¾ x 4½	4	2.50	6.00
2	1380	1395	6⅜	4 7/16	¾ x 4½	4	3.00	7.00
2	1382	1397	7⅛	5	⅞ x 4¾	4	3.50	8.25
2	1384	1399	8	5⅞	⅞ x 5	4	4.25	9.75
2½	604	1401	5⅜	4	¾ x 4½	4	2.00	5.00
2½	1386	1403	6⅛	4½	¾ x 4½	4	2.50	6.00
2½	1388	1405	6⅜	4 7/16	¾ x 4½	4	3.00	7.00
2½	1390	1407	7⅛	5	⅞ x 4¾	4	3.50	8.25
2½	1392	1409	8	5⅞	⅞ x 5	4	4.25	9.75
3	602	1411	6⅛	4½	¾ x 4½	4	2.50	6.00
3	1394	1413	6⅜	4 7/16	¾ x 4½	4	3.00	7.00
3	1396	1415	7⅛	5	⅞ x 4¾	4	3.50	8.25
3	1398	1417	8	5⅞	⅞ x 5	4	4.25	9.75

Blind

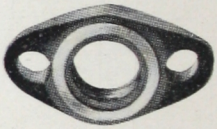
SIZE								
½	1400	617	3	1⅞	½ x 2¼	4	$0.60	$1.60
1	1402	613	3⅜	2⅝	½ x 2¾	4	.70	1.90
1¼	1404	611	3⅜	2⅝	½ x 2¾	4	.85	2.20
1½	1406	609	4½	3 1/16	⅝ x 3¼	4	.85	2.20
2	1408	607	4½	3 1/16	⅝ x 3¼	4	1.00	2.65
2½	1410	605	5⅜	4	¾ x 4½	4	2.00	5.00
3	1412	603	6⅛	4½	¾ x 4½	4	2.50	6.00

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Ammonia Flanges



FEMALE



MALE

Oval

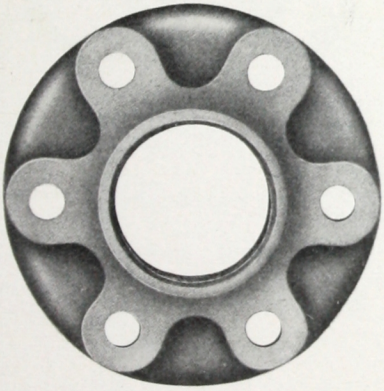
Size of Pipe Inches	Number of Male Flange	Number of Female Flange	Outside Size of Flange	Center of Bolts	Size of Bolts	Number of Bolts	Price each, less Bolts or Gasket	Price Per Pair, with Bolts and Gasket
1/4	750	1299	3 1/2	2 1/4	1/2 x 2 1/4	2	$0.40	$1.00
1/4	1300	1301	3 3/4	2 5/8	1/2 x 2 1/2	2	.50	1.20
1/4	1302	1303	4 1/8	2 3/4	5/8 x 3	2	.55	1.40
1/4	1304	1305	4 1/2	3 1/8	5/8 x 3	2	.65	1.60
1/4	1306	1307	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80
3/8	1308	651	3 3/4	2 5/8	1/2 x 2 1/2	2	.50	1.20
3/8	1310	1309	4 1/8	2 3/4	5/8 x 3	2	.55	1.40
3/8	1312	1311	4 1/2	3 1/8	5/8 x 3	2	.65	1.60
3/8	1314	1313	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80
1/2	652	1315	3 3/4	2 5/8	1/2 x 2 1/2	2	.50	1.20
1/2	1316	1317	4 1/8	2 3/4	5/8 x 3	2	.55	1.40
1/2	1318	1319	4 1/2	3 1/8	5/8 x 3	2	.65	1.60
1/2	1320	1321	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80
3/4	1322	1323	4 1/8	2 3/4	5/8 x 3	2	.55	1.40
3/4	1324	1325	4 1/2	3 1/8	5/8 x 3	2	.65	1.60
3/4	1326	1327	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80
1	656	1329	4 1/2	3 1/8	5/8 x 3	2	.65	1.60
1	1328	1331	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80
1 1/4	1330	1333	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80

Blind

SIZE								
1/4	1332	1335	3 1/2	2 1/4	1/2 x 2 1/4	2	.40	$1.00
3/8	1334	1337	3 3/4	2 5/8	1/2 x 2 1/2	2	.50	1.20
1/2	1336	653	3 3/4	2 5/8	1/2 x 2 1/2	2	.50	1.20
3/4	1338	1339	4 7/8	2 3/4	5/8 x 3	2	.55	1.40
1	658	1341	4 1/2	3 1/8	5/8 x 3	2	.65	1.60
1 1/4	1340	661	4 7/8	3 5/16	5/8 x 3 1/4	2	.75	1.80

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Ammonia Flanges

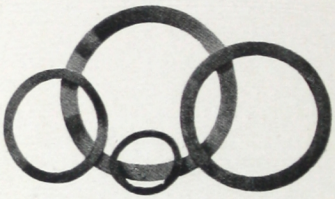


ROUND

Size of Pipe	Number of Flange	Diameter of Flange	Diameter of Bolt Circle	No. of Bolts	Size of Bolts	Price each less Bolts and Gasket	Price Per Pair with Bolts and Gasket
1	353	$4\frac{1}{2}$	$3\frac{1}{4}$	4	$\frac{1}{2}$ x $2\frac{3}{8}$	$1.85	$3.95
$1\frac{1}{4}$	352	5	$3\frac{7}{8}$	4	$\frac{1}{2}$ x $2\frac{3}{8}$	2.10	4.45
2	350	6	$4\frac{1}{2}$	4	$\frac{5}{8}$ x $2\frac{3}{4}$	2.50	5.40
$2\frac{1}{2}$	368	$7\frac{1}{4}$	$5\frac{3}{8}$	6	$\frac{5}{8}$ x $3\frac{1}{4}$	3.00	6.75
3	369	8	$6\frac{1}{4}$	6	$\frac{3}{4}$ x $3\frac{1}{4}$	3.50	7.80

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Rubber Gaskets

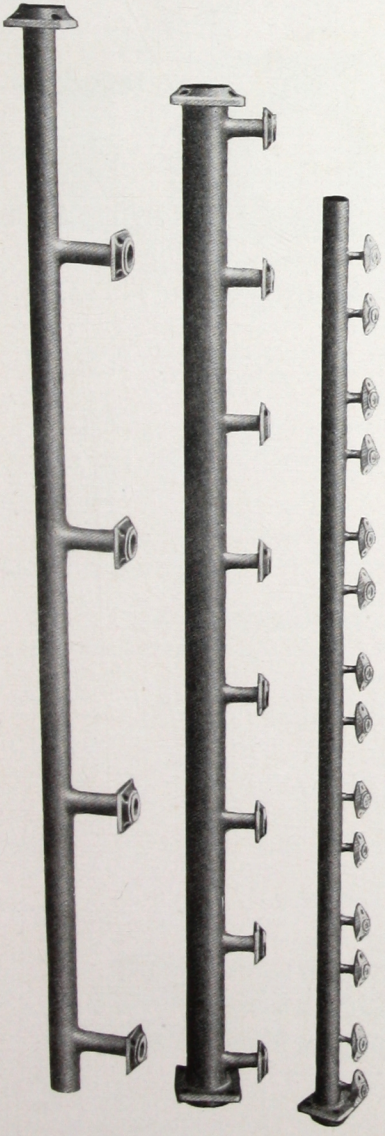


SIZE INCHES		Size of Return Bend	RUBBER GASKETS	
Inside Diameter	Outside Diameter		Number	Price per Doz.
$1\frac{1}{4}$	$1\frac{3}{4}$	1	1465	$0.30
$1\frac{13}{16}$	$2\frac{5}{16}$	$1\frac{1}{4}$	1470	.45
$1\frac{13}{16}$	$2\frac{5}{32}$	$1\frac{1}{2}$	1492	.45
$2\frac{1}{4}$	$2\frac{3}{4}$	2	1493	.55
3	$3\frac{1}{2}$	$2\frac{1}{2}$	1494	.65
$3\frac{1}{2}$	4	3	1495	.70
$1\frac{5}{8}$	$2\frac{5}{32}$	$1\frac{1}{4}$	1496	.45
$2\frac{5}{16}$	3	2	1497	.65

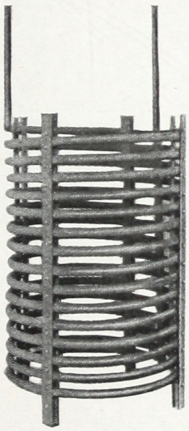
SIZE INCHES		Size and Style of Flange	RUBBER GASKETS	
Inside Diameter	Outside Diameter		Number	Price per Doz.
$\frac{7}{8}$	$1\frac{3}{8}$	$\frac{1}{4}$ oval	1476	$0.25
$1\frac{1}{4}$	$1\frac{3}{4}$	$\frac{3}{8}$ oval	1477	.30
$1\frac{1}{4}$	$1\frac{3}{4}$	$\frac{1}{2}$ oval	1478	.30
$1\frac{5}{16}$	$1\frac{13}{16}$	$\frac{3}{4}$ oval	1479	.40
$1\frac{5}{8}$	$2\frac{1}{8}$	1 oval	1480	.40
$1\frac{13}{16}$	$2\frac{5}{16}$	$1\frac{1}{4}$ oval	1481	.45
$1\frac{3}{4}$	$2\frac{3}{8}$	$1\frac{1}{4}$ square	1482	.50
$2\frac{1}{8}$	$2\frac{3}{4}$	$1\frac{1}{2}$ square	1483	.50
$2\frac{1}{2}$	$3\frac{1}{4}$	2 square	1484	.55
3	$3\frac{3}{4}$	$2\frac{1}{2}$ square	1485	.60
$3\frac{1}{2}$	$5\frac{1}{2}$	3 round	1486	.70
$3\frac{5}{8}$	$4\frac{1}{8}$	3 square	1487	.75
$1\frac{3}{8}$	$2\frac{3}{4}$	1 round	1488	.40
$1\frac{3}{4}$	$3\frac{3}{8}$	$1\frac{1}{4}$ round	1489	.50
$2\frac{3}{8}$	$3\frac{7}{8}$	2 round	1490	.55
$2\frac{7}{8}$	$4\frac{3}{4}$	$2\frac{1}{2}$ round	1491	.60

In ordering, specify size and number and "HOW TO SHIP."
Write for Discounts.

Ammonia Headers and Coils



EXTRA HEAVY PIPE HEADERS



COILS

Ammonia Coils

We can furnish continuous welded pipe coils of any size or style upon short notice.

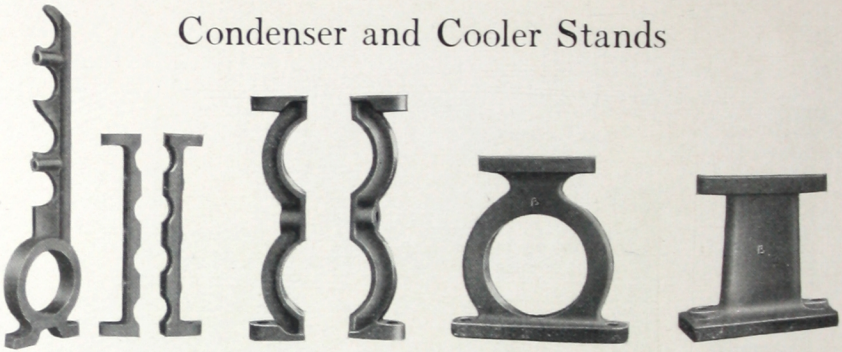
Prices on application.

Wrought Iron Branch Headers

We make any size branch headers in any combination. They are made of extra heavy pipe with the nipples welded in, and can be made to any desired center. When ordering specify size of header, and outlet, and style of flanges.

Prices on application.

Condenser and Cooler Stands

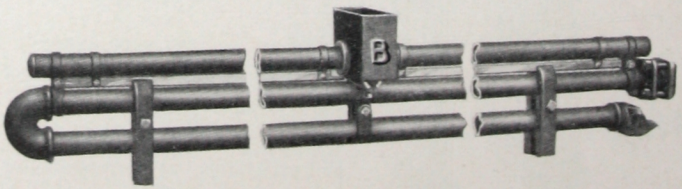


Number Pipes High	Number of Stand	Size Pipe Inches	Distance Center to Center of Pipe Inches	Price
3	921	2	4 combination	$2.70 Each
4	908	2	4 combination	2.85 Each
4	682	2	$3\frac{3}{4}$	2.40 per Pair
4	111	2	4	2.70
4	119	2	$4\frac{5}{8}$	3.10
4	127	3	$5\frac{1}{2}$	4.00
6	110	2	4	3.90
6	118	2	$4\frac{5}{8}$	4.50
6	128	3	$5\frac{1}{2}$	5.60
2	140	5	8	3.00

Liquid Receiver Stands

Diameter Receiver	Number	Width	Price, Each
4 inches	913	$10\frac{1}{4}$	$1.80
5 inches	915	$10\frac{3}{4}$	1.90
6 inches	916	12	2.70
8 inches	917	12	3.25
10 inches	918	14	4.70
Plain Bottom Stand	126	12	1.80

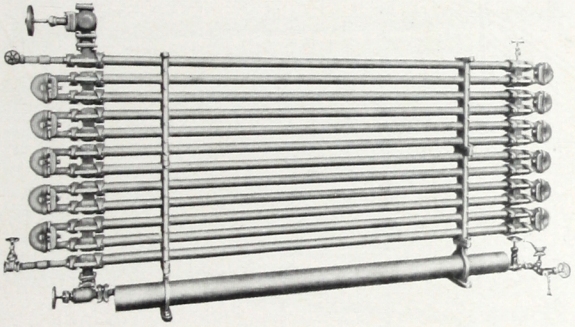
Sprinkling Device



The above cut illustrates our Sprinkling Device for atmospheric condensers. It is made in any lengths of heavily galvanized pipe, slotted so as to secure the most even distribution of water over the pipes.

Prices on application. Write for Discounts on Stands.

Double Pipe Ammonia Condenser



OUR IMPROVED DOUBLE PIPE CONDENSER

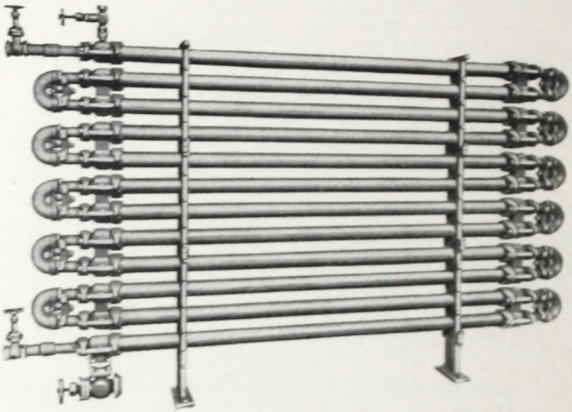
Special heavy fittings and special ammonia pipe used in these parts Notice the simple and effective construction and how easily the joints can be taken apart.

See page 44 for illustration and description of our Patented Double Pipe Return Bend.

Capacity Tons Refrigerator	CONDENSER, INCLUDING ALL VALVES			RECEIVER, INCLUDING VALVES		
	Number Pipes	Length	Weight	Dia. Inch	Length	Weight
1 to 2	3	11′ 6″	315	4	8′ 6″	95
2 to 3	4	11′ 6″	430	4	8′ 6″	95
4 to 5	8	11′ 6″	900	6	8′ 6″	150
	4	20′ 6″	660	4	17′ 4″	190
6 to 7	12	11′ 6″	1300	6	8′ 6″	170
	6	20′ 6″	1000	5	17′ 4″	190
8 to 10	16	11′ 6″	1760	8	8′ 6″	300
	8	20′ 6″	1300	6	17′ 4″	340
10 to 12	10	20′ 6″	1600	6	17′ 4″	340
12 to 15	12	20′ 6″	1900	6	17′ 4″	340

Prices on application.

Double Pipe Brine Cooler



OUR IMPROVED DOUBLE PIPE BRINE COOLER

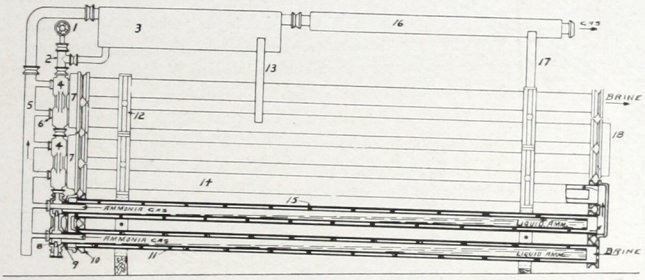
Special heavy fittings and special ammonia pipe used in these parts. Notice the simple and effective construction and how easily the joints can be taken apart.

See page 44 for illustration and description of our Patented Double Pipe Return Bend.

Tons Capacity	Number Pipes	Length	Weight
2½ to 3	4	10′ 6″	810
	2	18′ 6″	640
4	6	10′ 6″	1160
5 to 6	8	10′ 6″	1520
	4	18′ 6″	1170
6 to 6½	10	10′ 6″	1870
7 to 8	12	10′ 6″	2210
	6	18′ 6″	1725
9 to 10	14	10′ 6″	2540
	8	18′ 6″	2240
11 to 12	10	18′ 6″	2765
13 to 15	12	18′ 6″	3300

Prices on application

Flooded Type Brine Cooler



1—Expansion Valve.
2—Injector Tee.
3—Ammonia Accumulator.
4—Ammonia Inlet Header.
5—Ammonia Suction Header.
6—Packing Gland.
7—Open Brine Return Bend.
8—Liquid Overflow Fitting.
9—3-inch Packing Ring and Gasket.
10—5-inch Square Flange.
11—3-inch Ammonia Expansion Pipe.
12—Stands.
13—Accumulator Stand.
14—5-inch Brine Pipe.
15—Spiral.
16—Liquid Pre-Cooler.
17—Liquid Pre-Cooler Stand.
18—Blind Brine Return Bend.

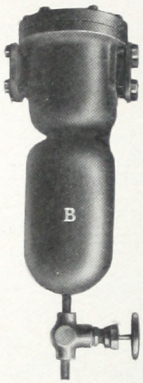
Our Patent Double Pipe Flooded Type Brine Cooler has all the advantages of the flooded system and none of the disadvantages. Our apparatus is at all times under the eye of the operator, while other flooded systems are submerged in a tank of brine beyond the control or sight of the party operating the plant. The increase in the capacity of the machine with our flooded system is very marked, often as great as 30%.

Tons Capacity	Number Pipes	Length	Weight	Price
$4\frac{1}{2}$	4	12 feet	1500	$245.00
$6\frac{3}{4}$	6	12 feet	2100	330.00
9	8	12 feet	2700	410.00
$11\frac{1}{4}$	10	12 feet	3300	495.00
$13\frac{1}{4}$	12	12 feet	3900	585.00
9	4	22 feet	2100	310.00
$13\frac{1}{2}$	6	22 feet	3000	420.00
18	8	22 feet	3900	535.00
$22\frac{1}{2}$	10	22 feet	4800	650.00
$26\frac{1}{2}$	12	22 feet	5800	800.00

NOTE—Above prices include Accumulator and Liquid Pre-Cooler.

Write for Discounts.

Ammonia Oil Separators

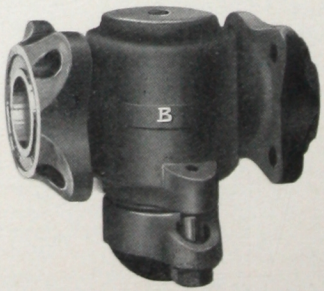


Diameter Inches	Length Inches	Number	Size of Pipe Connection	Weight	Price
$6\frac{1}{2}$	17	303	1″	75	$45.00
$6\frac{1}{2}$	17	1498	$1\frac{1}{4}$″	85	55.00
$8\frac{1}{2}$	25	300	2″	175	72.50
$8\frac{1}{2}$	25	1499	$2\frac{1}{2}$″	200	80.00

The above cut shows our Ammonia Oil Separator used to prevent oil which may come from the compressor entering the ammonia condenser. These separators are cast of semi-steel, fitted with a removable cover, companion flanges and blow-off valve, tested to 300 pounds air pressure. The top of the trap is fitted with a baffle plate to abstract from the ammonia gas any oil that may come in contact with it, dropping it to the bottom of the trap so that it can be blown off.

Write for Discounts.

Suction Scale Traps



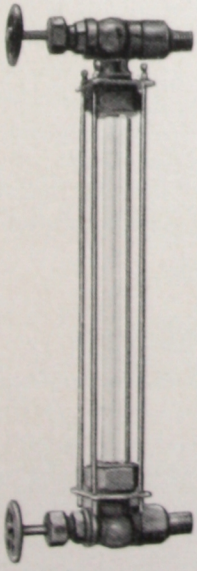
Our Suction Scale Traps are constructed to prevent scale, grit, or foreign matter of any kind from entering the compressor. They are fitted with companion flanges and a cleanout connection equipped with a large pocket below the screen so as to allow the foreign matter to drop out of the screen and not interfere with the gases going to the compressor. Made in all sizes.

Prices on application.

Ammonia Receivers

We can furnish Ammonia Receivers of any size and length desired, of either the vertical or horizontal type. Our receivers are made of the very best of flange steel, the heads being welded to the shell, all tested to a pressure of 500 pounds.

RECEIVER, INCLUDING ALL VALVES				RECEIVER, INCLUDING ALL VALVES			
Diameter Inches	Length	Weight	Price	Diameter Inches	Length	Weight	Price
4	8′ 6″	95	$36.00	6	17′ 4″	340	$ 72.00
5	8′ 6″	150	50.00	8	17′ 4″	510	115.00
4	17′ 4″	190	50.00	10	8′ 6″	360	120.00
6	8′ 6″	170	57.00	10	17′ 4″	725	155.00
8	8′ 6″	300	86.00				



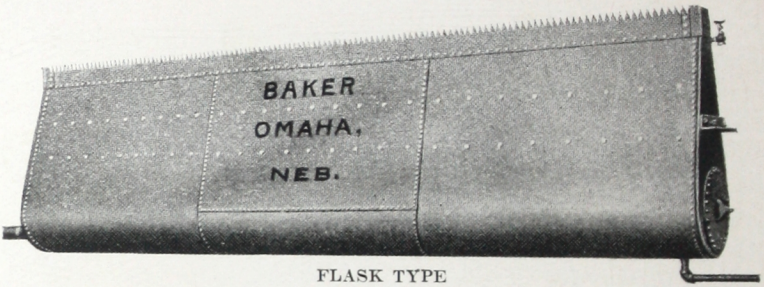
Automatic Liquid Ammonia Gauge

Our Automatic Liquid Ammonia Gauges are fitted with automatic closing valves, so that the valve will automatically close in the event of the glass tube being broken. These gauges are used to ascertain the amount of liquid ammonia in the liquid receiver.

SIZE	PRICE
½ inch, standard with guards and glass	$10.00
½ inch, extra heavy with guards and glass	12.50
¾ inch, standard with guards and glass	12.50
¾ inch, extra heavy with guards and glass	15.00
1 inch, standard with guards and glass	15.00
1 inch, extra heavy with guards and glass	20.00

Write for Discounts

Exhaust Steam Condensers



FLASK TYPE

The above cut shows our Flask Type Steam Condenser which is made of heavy galvanized steel and properly brazed inside to prevent bulging. These condensers are fitted on the lower ends with an exhaust steam inlet flange, and at the opposite end a condensed water outlet flange, top being fitted with a water distributing device and an outlet for the foul gases. These condensers are very efficient on account of their large cooling surface and are very easy to keep clean, any scale that may form being kept free by the expansion and contraction of the metal.

WE ALSO MAKE

Double Pipe Exhaust Steam Condensers

Our Double Pipe Exhaust Steam Condensers are made of 2″ and $1\frac{1}{4}$″ galvanized pipe. They are galvanized throughout and fitted with clamps and stands. The steam enters these condensers between the $1\frac{1}{4}$″ and 2″ pipe, the cool water passing through the $1\frac{1}{4}$″ pipe in the opposite direction to the flow of the steam. With this style condenser the coldest cooling water comes in contact with the condensed water just before it leaves the condenser. In this way the condensed water can be obtained at almost the same temperature as the cooling water. We furnish these condensers fitted with inlet and outlet steam and water valves.

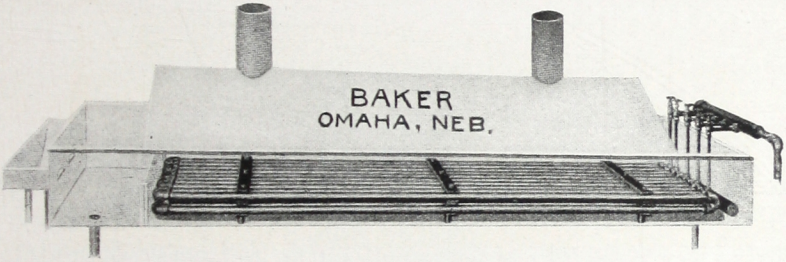
WE ALSO MAKE

Atmospheric Exhaust Steam Condensers

Our Atmospheric Exhaust Steam Condensers are made of 2″ galvanized iron pipe fitted on the ends with headers into which the exhaust steam enters, each one of the 2″ pipes being fitted with a connection so that any pipe can be taken out and replaced without interfering with the balance of the condenser. These condensers are fitted with water distributing device, foul gas outlet, condensed water outlet, a drip pan being placed in under them to collect the cooling water.

Prices on application.

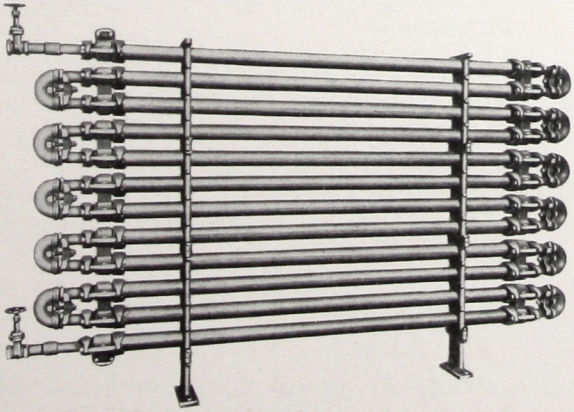
Reboiler and Skimmer



The above cut shows our Standard Reboiling and Skimming Apparatus. These are made in rectangular shape of heavy galvanized steel, fitted with steam coils which are fed from a header, fitted with valves for adjusting the steam supply. The condensed water enters the reboiler at the opposite end from the skimming attachment causing the water to travel the full length of the steam coil during which time it is thoroughly boiled. The reboiled water is taken from the bottom of the tank close to the skimming attachment, the impurities being skimmed from the surface of the water through small openings into a pan which is connected to the sewer. These reboilers are fitted with V-shaped covers, having openings to carry off all steam and gases.

Made in all sizes. Prices on application.

Double Pipe Distilled Water Cooler



Our Double Pipe Distilled Water Cooler is of the same careful construction as are our double pipe ammonia condenser and brine cooler. All parts in contact with the distilled water are heavily galvanized. The counter current ensures a thorough cooling of the water, and a maximum efficiency. See page 44 for detail of Return Bend.

Prices on application.

Special Notice

In addition to this *Fitting Catalog*, we also issue a *separate catalog* showing our *High-grade Ammonia Compressors*, direct connected to engine, belt driven with any available power, and motor driven either direct, belt or gear drive.

We have also *Special Bulletins* dealing exclusively with *our Ice Making Plants*, and giving descriptive layout of *our Refrigerating Machinery*, of which we make a specialty for the following lines of work:

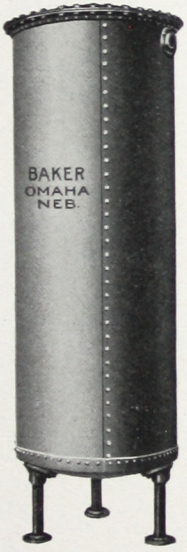
MEAT MARKETS
CREAMERIES
CONFECTIONERS
ICE CREAM MANUFACTURERS
CHEESE MAKERS
GROCERS
PRODUCE AND FRUIT STORAGE
BAKERIES
FISH AND OYSTER DEALERS
FUR STORAGE
HOTELS, CAFES, ETC.

We install several different systems for refrigeration depending on the local conditions existing, the nature of the work to be performed, and the quantity of goods to be refrigerated.

We have also *Special Water Cooling Bulletins* for plants for *bottlers, factories, offices* and *large buildings.*

We would be pleased to mail you either that you may be particularly interested in.

Filter



CHARCOAL AND QUARTZ

Our Charcoal and Quartz Filters shown above, are constructed of galvanized steel throughout, fitted with a removable cover which is bolted to a top angle ring, a gasket being provided to make top water tight. They are also fitted inside with metal rings and screws for holding the filtering medium in place, charcoal and crushed quartz being used for filtering medium.

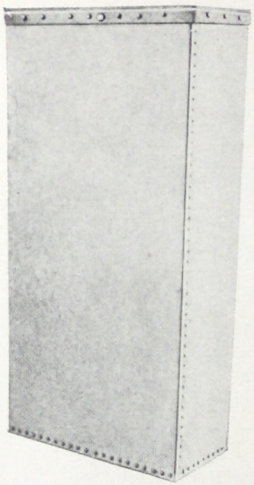
Prices on application.

Flat Filters

Our Flat Filters are constructed of galvanized iron and bronze. The filtering medium is cloth and a special filtering paper. We highly recommend this filter for ice plants or where thoroughly filtered water is required.

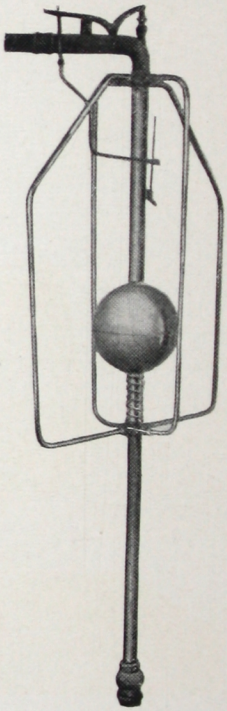
Prices on application.

Ice Cans



Cans are made throughout of galvanized material, well riveted and soldered, and guaranteed tight. Cans made of No. 16 gauge material will be turned over top and bottom. The 200, 300 and 400-pound cans have $\frac{1}{4}$ x 2-inch galvanized bands around top. Small sizes have $\frac{1}{4}$ x $1\frac{1}{4}$-inch bands; $\frac{5}{8}$-inch lifting holes are punched through bands. Prices quoted on application.

Automatic Can Fillers



In ordering, give inside dimensions of can at top and inside depth.

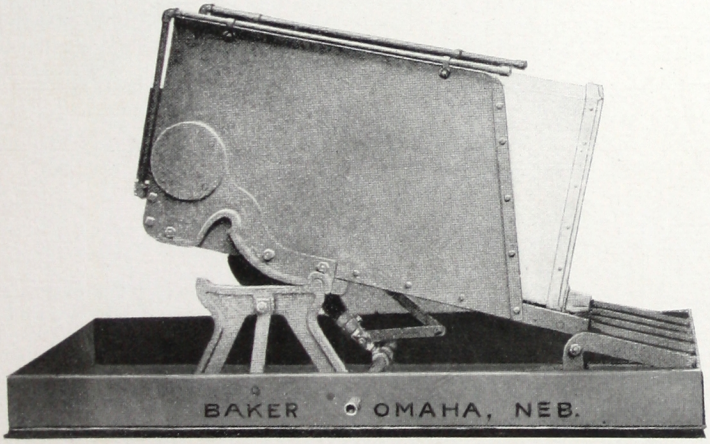
	Price Complete
Crated, 100-pound can	$26.00
Crated, 200-pound can	26.00
Crated, 300-pound can	30.00
Crated, 400-pound can	33.00

Write for Discounts.

Weight of Cake of Ice	Inside Dimensions			Length Over All	Thickness of Material U. S. Standard Gauge	
	Top	Bottom	Length		Sides	Bottom
50 lbs.	8 x 8	$7\frac{1}{2}$ x $7\frac{1}{2}$	31	32	No. 16	No. 16
100 lbs.	8 x 16	$7\frac{1}{4}$ x $15\frac{1}{4}$	31	32	No. 16	No. 16
200 lbs.	$11\frac{1}{2}$ x $22\frac{1}{2}$	$10\frac{1}{2}$ x $21\frac{1}{2}$	31	32	No. 16	No. 16
300 lbs.	$11\frac{1}{2}$ x $22\frac{1}{2}$	$10\frac{1}{2}$ x $21\frac{1}{2}$	44	45	No. 16	No. 16
400 lbs.	$11\frac{1}{2}$ x $22\frac{1}{2}$	$10\frac{1}{2}$ x $21\frac{1}{2}$	57	58	No. 14	No. 14

The above sizes are in accordance with the standard adopted by the Ice Machine Builders Association of the United States. These sizes are carried in stock, and prices will be quoted on application. All other sizes are regarded as special, will be built only on order, and will be subject to special price.

Automatic Ice Dumps



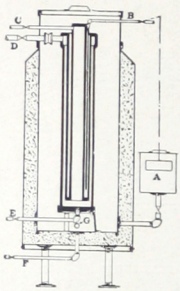
ROCKING TYPE

Our Ice Dumps are made of steel with cast iron balance weights, the entire apparatus being constructed very substantially, fitted with welded iron pans to catch the waste water, and fitted with automatic water shut-off, which is self-operating when the ice leaves the can.

Made in all sizes.

Prices on application.

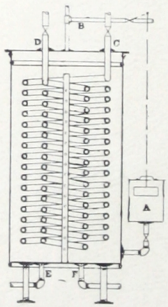
Our Special Water-Cooling Systems



A—Float Tank
B—Water Supply
C—Ammonia Expansion Valve
D—Ammonia Suction Valve
E—Blow Off Valve
F—Drain
G—Water Supply to Pump

Triple Pipe Gravity System

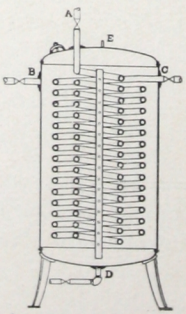
This is our new patented type of Water Cooler and is used extensively for bottler's use and for cooling water for buildings and factories. The cooling tank consists of two tanks, one inside the other, and the space between is thoroughly insulated with cork insulation. This cooling tank is made in different sizes, cooling from 500 to 4,000 gallons of water in ten hours through a range of 20 to 40 degrees F. This cooler is patented and is known as the triplex system. There are no coils inside the water cooling tank, but the cooling surface is of very large pipes thoroughly tinned throughout. The water passes over a tinned surface so that by the time the water has passed over this surface it is reduced almost to freezing point. The entire apparatus is extremely simple in construction and very effective. One of the principal advantages with this device is that five minutes after starting the plant up you can get as cold water as you desire and a steady stream of cold water can be taken from the apparatus continually. This system is similar to the gravity system described below and requires a triplex or force pump to operate it successfully. There is also a float on this for regulating the level of the water in the main tank.



A—Float Tank
B—Water Supply
C—Ammonia Expansion Valve
D—Ammonia Suction Valve
E—Water Supply to Pump
F—Drain

Gravity System

This system is used where the water pressure is not strong enough to raise the water to the faucets on the upper floors of the building. After the plant is once in operation it is to a certain extent a balance system, as the fall on the down leg equalizes the power required to lift the water on the up leg from which the water to the faucets is taken. There is a float attached to the side of this tank through which the city water is brought after passing through the filter, which regulates the amount of water in the main tank. The advantage of keeping the water supply at a given level in the tank is that you can thereby get a greater efficiency out of the coils in the water cooler tank. This type has a quantity of galvanized spiral coils and the tank is made of galvanized sheet metal.



A—Ammonia Suction
B—City Water Supply
C—Ammonia Expansion Valve
D—Blow Off
E—Air Cock

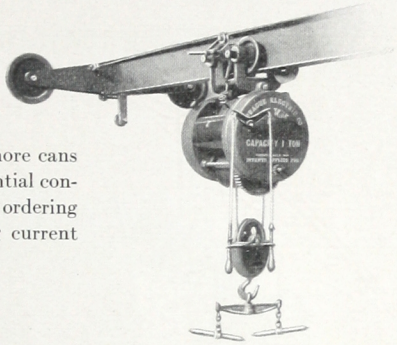
Pressure System

This system is operated in the following manner. There is a heavy iron tank made to withstand the city pressure where the tank is to be located, and in this tank is installed a certain amount of spiral coils. The tank is made absolutely water tight and is made to withstand any pressure that may be brought upon it. The water from the city mains is brought into this tank at the top and the suction or cold water is taken out at the bottom. There is a small centrifugal pump attached to this cold water line, and the discharge of this pump circulates the water throughout the building and returns over a loop which is above the highest faucet, back to the tank again. The centrifugal pump is simply for the purpose of keeping the water in motion so that there will always be absolutely cold ice water at the faucet. This system is automatic in operation and takes the advantage of the city pressure for carrying the water to the different floors of the building, thus reducing the amount of power required to operate the plant successfully.

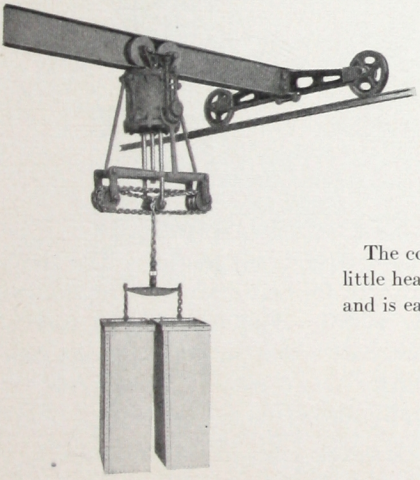
Prices on application.

Electric Hoist

This illustration shows our Electric Ice Hoist. We recommend these electric hoists for plants of the larger sizes. We furnish these hoists arranged for lifting one or more cans at a time. These hoists are light and of substantial construction and operate very economically. When ordering state voltage, also whether direct or alternating current is to be used.



ELECTRIC HOIST



AIR HOIST

Air Hoist

The construction of this Air Hoist is such that a very little head room is required. Operation is very simple and is easily controlled by the operator.

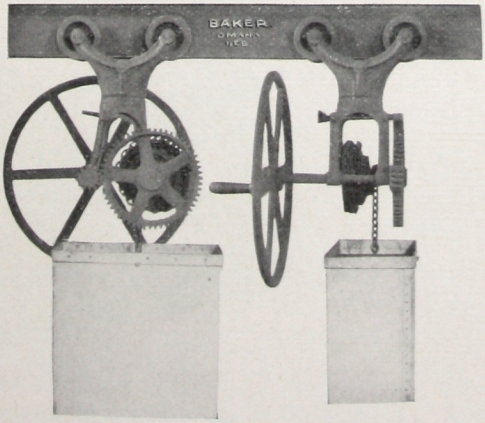
Prices of Hoists on application.

New Style Swivel Hand Hoist and Conveyor

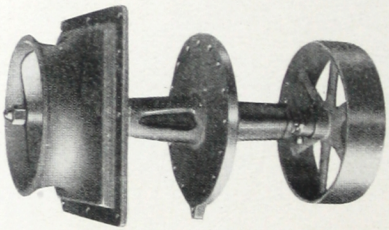
This cut illustrates our standard new style Swivel Hand Hoist and Conveyor for handling ice cans which shows it only in two different positions.

The Conveyor consists of a steel "I" beam of ample strength. The wheels of the Conveyor are fitted with roller bearings, insuring easy running throughout the length of the tank.

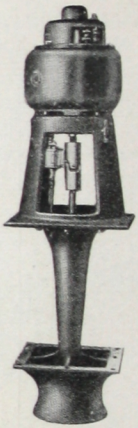
The Hoist is so designed as to turn freely in all directions, and may be used not only where other styles can, but has advantages not found in others. It is of special advantage when there is very little room between wall and side of the ice tank in cases where the regular styles cannot be used.



Brine Agitators



HORIZONTAL

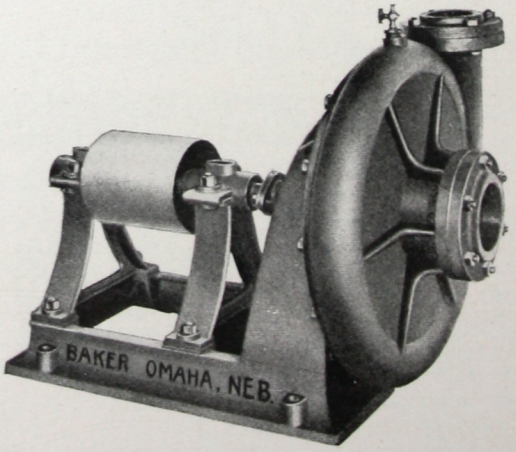


VERTICAL

We make our Brine Agitators either vertical or horizontal. The above cuts show our horizontal agitators arranged for belt drive and the vertical agitator direct connected to electric motor. The propeller is cast of bronze and the shaft of steel. All bearings are extra large and are babbitted with the highest grade of babbitt.

Prices on application.

Brine Circulating Pumps



Made in various sizes and styles.
Prices on application.

Ammonia Gauges and Gauge Board

METAL GAUGE BOARD

The above cut shows our Standard Metal Gauge Board and Gauges, which is arranged for holding one high and one low pressure gauge.

We also make marble, slate, or metal gauge boards of any size to accommodate any number of gauges.

SIZE	PRICE
2-hole metal gauge board for $4\frac{1}{2}$-inch gauges	$4.50
2-hole metal gauge board for $6\frac{3}{4}$-inch gauges	6.50

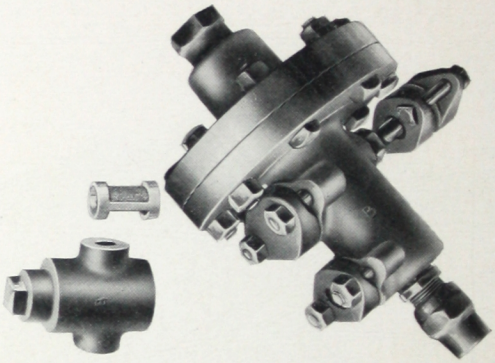
Ammonia Gauges

When ordering gauges, give size of gauge, state whether gauge is for high or low pressure, also state whether a compound gauge is wanted, showing both pressure and vacuum, or pressure only. Also state whether bottom or back connections are wanted.

SIZE	PRICE
$4\frac{1}{2}$-inch dial, iron case and nickle-plated ring	$22.00
$6\frac{3}{4}$-inch dial, iron case and nickle-plated ring	26.50

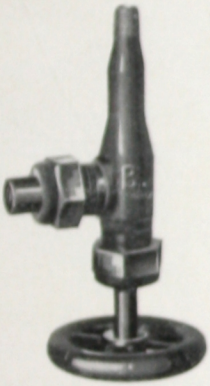
Write for Discounts.

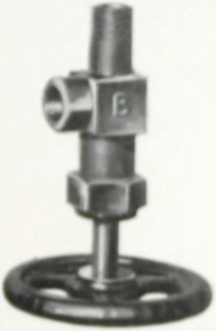
Automatic Ammonia Expansion Valve



Our newly Patented Automatic Expansion Valve is designed for the purpose of regulating the back pressure in ammonia systems, and by so doing, the temperature is regulated in the cold storage rooms, or wherever this valve is used. It is absolutely efficient and reliable in its action, and we mention a few of the many instances where it is of great value in regulating the back pressure: In direct expansion cold storage rooms; in indirect combined brine and ammonia cold storage rooms where hold-over tanks are used; in ammonia coils submerged in a brine tank; and also on our Patented Flooded Type Brine Cooler, or on the regular Standard Double Pipe Brine Cooler. In installations where there are two or three or more refrigerator boxes located in different parts of the building or on different floors, it requires very fine adjustment of the ordinary expansion valves, and even with the greatest care and attention they frequently require readjustment several times a day, and even then they never work in perfect harmony, for the reason that one or more of the valves may get choked with scale or dirt, thus reducing the refrigeration of the boxes and causing considerable trouble and annoyance. Our Patent Automatic Expansion Valve eliminates trouble of this kind entirely because of its construction, and the one main valve can be opened or closed in the machine room with every assurance that an exact back pressure will be obtained in the different boxes or chambers where these valves are located. Our Patent Automatic Expansion Valve is so constructed that the flow of liquid ammonia is regulated to accommodate the size of the compressor which is taking the gas away from the low pressure side, or what is known as the expansion side. It is particularly adapted for placing in plants where the cold storage rooms are scattered throughout the building. These valves are giving the highest satisfaction wherever they are in use, and are being universally adopted because of their economy and convenience. Price, complete, $50.00.

Special Ammonia Fittings





The above cut shows our Screw End Angle Valve of the smallest size. The body is made of open hearth machine steel, and the valve stem of tool steel with hardened seat.

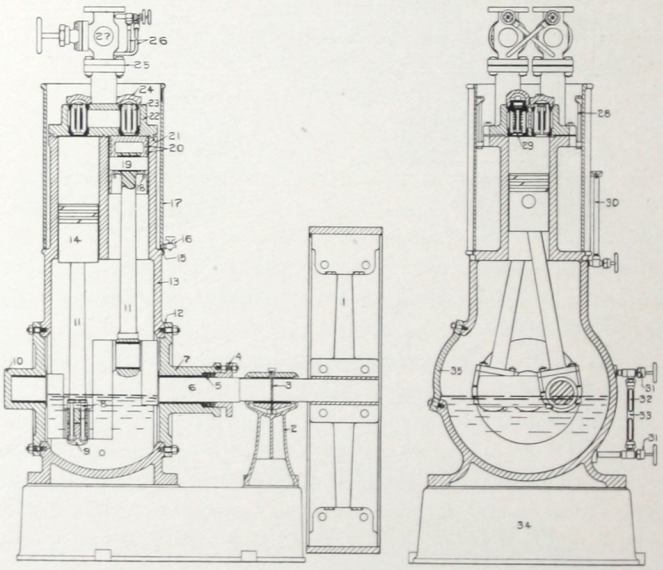
See page 10 for prices.

Square Flanged Offset Fitting

This fitting is made of semi-steel, and designed specially to eliminate work and extra fittings wherever it is necessary to connect with coils in tank.

Price, less Companion Flanges, Bolts and Gaskets $2.75

Sectional Cut of Compressor



1—Fly Wheel.
2—Out Board Bearing.
3—Oiling Chain.
4—Packing Gland.
5—Shaft Packing.
6—Crank Shaft.
7—Main Bearing.
8—Crank Pin Box Bolts.
9—Crank Pin Box.
10—Blind Bearing.
11—Connecting Rods.
12—Bearing Gaskets.
13—Compressor Frame.
14—Pistons.
15—Water Jacket Gaskets.
16—Drain Cock.
17—Water Jacket.
18—Piston Pin Set Screws.
19—Piston Pin.
20—Piston Rings.
21—Cylinder Head Gaskets.
22—Cylinder Head.
23—Suction Valves.
24—Valve Caps.
25—Main Valve Gaskets.
26—By-Pass Connections.
27—Main Valve.
28—Water Jacket Bolts.
29—Discharge Valve.
30—Equalizing Line.
31—Gauge Glass Valves.
32—Gauge Glass.
33—Gauge Glass Guard.
34—Bed Plate.
35—Cover Plate.

Sectional drawing showing construction in detail of the simple and compact design of our Ammonia Compressors. Note the automatic oiling system.

Our Compressor Construction

We particularly want to call your attention to the construction of our Compressor in its different parts, as we believe our success is largely due to the special features found in our Compressor only, as well as to the fact that we use nothing but the highest grade of material. The metals used in the construction of our Compressor are semi-steel, forged steel and tool steel.

The valves are the most important part of any compressor, and upon the proper operation of them depends in a large measure the capacity of the compressor, more especially the discharge valve, as this valve handles the high pressure gas, and therefore should open and close quickly; otherwise too much pressure is generated in the cylinder and unnecessary power consumed; and, should this valve be retarded in closing, the leaking back of the compressed gas into the cylinders will reduce the capacity and cause a further loss of power.

The *Discharge Valves* of our Compressor, are so constructed that they open and close with the least possible amount of resistance, and, owing to our special cushion effect, are practically noiseless. The construction of the cushioning piston is such that it does not in any way retard the return of the valve to its seat.

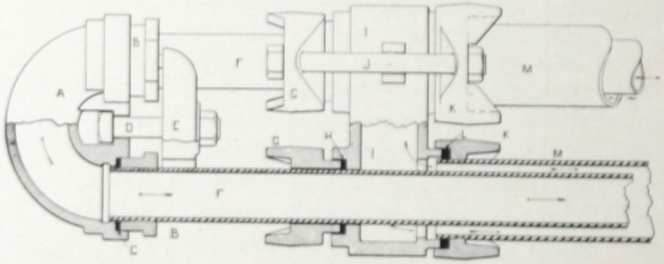
The *Suction Valve Stems* are turned out of a solid bar of tool steel, therefore using only the heart of the metal. The seats on both valves are narrow, therefore open quickly, and are also made of tool steel. The construction of both discharge and suction valves is such that the greatest possible amount of opening for the gas passage is given with the least possible amount of lift or movement of the valve.

The construction of our valves differs in this essential from any other valves on the market, and for simplicity and durability they are unequaled. Our machinists are all experts in this class of work, and it is these very essential components, together with years of experience in the manufacture of refrigerating machinery, that has made the *Baker Ice Machine Company's* Compressor the best in the world.

Our Special Double Pipe Fittings

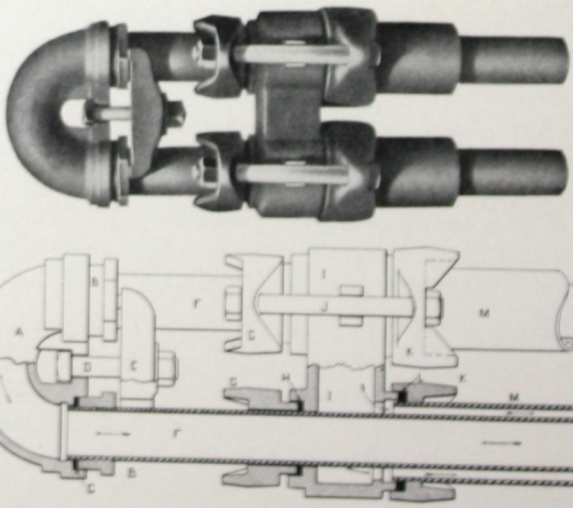
Patented Return Bends

We show below drawings and illustrations of our Patent Return Bend, as used on our Double Pipe Ammonia Condenser and Brine Cooler, which is but one of many patents in our plants owned and controlled exclusively by us. This return bend is so constructed that any one with a wrench can readily put it together, or replace any part that may be required. The water or brine return bend is held in place by a single bolt. The pressure exerted by this bolt is central, and in this way draws up the return bend even on both sides, thereby getting a tight joint with the least possible amount of pressure, and without any screwed joints.



PATENT DOUBLE PIPE RETURN BEND FOR AMMONIA CONDENSER

A—Water Return Bend
B—Gland for Water Return Bend
C—Gasket for Water Return Bend
D—Bolt
E—Clamp
F—Condensing Water Pipe
G—Slip Flange
H—Gasket for Ammonia Return Bend
I—Ammonia Return Bend
J—Bolt
K—Screw Flange
L—Gasket
M—Ammonia Pipe



PATENT DOUBLE PIPE RETURN BEND FOR BRINE COOLER

A—Brine Return Bend
B—Gland for Brine Return Bend
C—Gasket for Brine Return Bend
D—Bolt
E—Clamp
F—Brine Pipe
G—Slip Flange
H—Gasket for Ammonia Return Bend
I—Ammonia Return Bend
J—Bolt
K—Screw Flange
L—Gasket
M—Ammonia Pipe

Manufacturers' Standard List of Machine Bolts

With Square Heads and Square Nuts. Finished Points—Price per Hundred

Adopted September 20, 1899, to take effect October 1, 1899.

Length Inches	1/4	5/16	3/8	7/16	1/2	9/16 & 5/8	3/4	7/8	1	1 1/8	1 1/4
1 1/2	$1.70	$2.00	$2.40	$2.80	$3.60	$5.20	$7.20	$10.50	$15.10	$22.50	$30.00
2	1.78	2.12	2.56	3.00	3.86	5.58	7.70	11.20	16.00	23.70	31.50
2 1/2	1.86	2.24	2.72	3.20	4.12	5.96	8.20	11.90	16.90	24.90	33.00
3	1.94	2.36	2.88	3.40	4.38	6.34	8.70	12.60	17.80	26.10	34.50
3 1/2	2.02	2.48	3.04	3.60	4.64	6.72	9.20	13.30	18.70	27.30	36.00
4	2.10	2.60	3.20	3.80	4.90	7.10	9.70	14.00	19.60	28.50	37.50
4 1/2	2.18	2.72	3.36	4.00	5.16	7.48	10.20	14.70	20.50	29.70	39.00
5	2.26	2.84	3.52	4.20	5.42	7.86	10.70	15.40	21.40	30.90	40.50
5 1/2	2.34	2.96	3.68	4.40	5.68	8.24	11.20	16.10	22.30	32.10	42.00
6	2.42	3.08	3.84	4.60	5.94	8.62	11.70	16.80	23.20	33.30	43.50
6 1/2	2.50	3.20	4.00	4.80	6.20	9.00	12.20	17.50	24.10	34.50	45.00
7	2.58	3.32	4.16	5.00	6.46	9.38	12.70	18.20	25.00	35.70	46.50
7 1/2	2.66	3.44	4.32	5.20	6.72	9.76	13.20	18.90	25.90	36.90	48.00
8	2.74	3.56	4.48	5.40	6.98	10.14	13.70	19.60	26.80	38.10	49.50
9	2.90	3.80	4.80	5.80	7.50	10.90	14.70	21.00	28.60	40.50	52.50
10	3.06	4.04	5.12	6.20	8.02	11.66	15.70	22.40	30.40	42.90	55.50
11	3.22	4.28	5.44	6.60	8.54	12.42	16.70	23.80	32.20	45.30	58.50
12	3.38	4.52	5.76	7.00	9.06	13.18	17.70	25.20	34.00	47.70	61.50
13			6.08	7.40	9.58	13.94	18.70	26.60	35.80	50.10	64.50
14			6.40	7.80	10.10	14.70	19.70	28.00	37.60	52.50	67.50
15			6.72	8.20	10.62	15.46	20.70	29.40	39.40	54.90	70.50
16			7.04	8.60	11.14	16.22	21.70	30.80	41.20	57.30	73.50
17					11.66	16.98	22.70	32.20	43.00	59.70	76.50
18					12.18	17.74	23.70	33.60	44.80	62.10	79.50
19					12.70	18.50	24.70	35.00	46.60	64.50	82.50
20					13.22	19.26	25.70	36.40	48.40	66.90	85.50
21							26.70	37.80	50.20	69.30	88.50
22							27.70	39.20	52.00	71.70	91.50
23							28.70	40.60	53.80	74.10	94.50
24							29.70	42.00	55.60	76.50	97.50
25							30.70	43.40	57.40	78.90	100.50
26							31.70	44.80	59.20	81.30	103.50
27							32.70	46.20	61.00	83.70	106.50
28							33.70	47.60	62.80	86.10	109.50
29							34.70	49.00	64.60	88.50	112.50
30							35.70	50.40	66.40	90.90	115.50

The following extras are to be understood as a part of this list: Bolts with hexagon heads or hexagon nuts, *10 per cent extra.* If both hexagon heads and hexagon nuts, 20 per cent extra.

NOTE—All bolts used on our ammonia fittings have cold punched, chamfered, and trimmed hexagon nuts.

Dimensions of Wrought Iron and Steel Pipe

STANDARD

DIAMETER			Thickness of Metal	CIRCUMFERENCE		TRAVERSE AREAS			Length of Pipe per Square Foot of		Length of Pipe Containing One Cubic Foot	Weight per Foot of Length	No. of Threads per Inch of Screw	Contents in U. S. Gals. per Foot of Length	Weight of Water per Foot of Length
Nominal Internal	Actual External	Actual Internal		External	Internal	External	Internal	Metal	External Surface	Internal Surface					
Inches	Inches	Inches	Inches	Inches	Inches	Sq. Inch	Sq. Inch	Sq. Inch	Feet	Feet	Feet	Lbs.		Gals.	Lbs.
⅛	.405	.27	.068	1.272	.848	.129	.0573	.0717	9.434	14.151	2500.	.241	27	.0029	.024
¼	.54	.364	.085	1.696	1.144	.229	.1041	.1249	7.075	10.5	1383.28	.42	18	.0054	.045
⅜	.675	.493	.091	2.121	1.552	.358	.1917	.1663	5.658	7.732	754.322	.559	18	.0099	.083
½	.84	.622	.109	2.639	1.957	.554	.3048	.2492	4.547	6.132	473.84	.837	14	.0158	.132
¾	1.05	.824	.113	3.299	2.589	.866	.5333	.3327	3.638	4.635	270.016	1.115	14	.0277	.231
1	1.315	1.048	.134	4.131	3.292	1.358	.861	.497	2.904	3.645	167.246	1.668	11½	.0447	.373
1¼	1.66	1.38	.14	5.215	4.335	2.164	1.496	.668	2.301	2.768	96.257	2.244	11½	.0777	.648
1½	1.9	1.610	.145	5.969	5.058	2.835	2.036	.799	2.01	2.372	70.727	2.678	11½	.1058	.882
2	2.375	2.067	.154	7.461	6.434	4.43	3.356	1.074	1.608	1.848	42.908	3.609	11½	.1743	1.453
2½	2.875	2.468	.204	9.032	7.753	6.492	4.780	1.712	1.329	1.548	30.337	5.739	8	.2483	2.070
3	3.5	3.067	.217	10.996	9.635	9.621	7.383	2.238	1.091	1.245	19.504	7.536	8	.3835	3.197
3½	4.	3.548	.226	12.566	11.146	12.566	9.887	2.679	.955	1.077	14.567	9.001	8	.5136	4.291
4	4.5	4.026	.237	14.137	12.648	15.904	12.73	3.174	.849	.949	11.312	10.665	8	.6613	5.512
4½	5.	4.508	.246	15.708	14.162	19.635	15.961	3.674	.764	.847	9.022	12.34	8	.829	6.910
5	5.563	5.045	.259	17.477	15.849	24.301	19.986	4.315	.687	.757	7.205	14.502	8	1.038	8.652
6	6.625	6.065	.28	20.813	19.054	34.472	28.890	5.582	.577	.63	4.984	18.762	8	1.500	12.503
7	7.625	7.023	.301	23.955	22.063	45.664	38.738	6.926	.501	.543	3.717	23.271	8	2.012	16.771
8	8.625	7.981	.322	27.096	25.076	58.426	50.027	8.399	.443	.479	2.876	28.177	8	2.599	21.664
9	9.625	8.937	.344	30.238	28.076	72.76	62.73	10.03	.397	.427	2.29	33.701	8	3.259	27.166
10	10.75	10.018	.366	33.772	31.476	90.763	78.823	11.940	.355	.382	1.827	40.065	8	4.095	34.134
11	11.75	11.	.375	37.699	34.558	108.434	95.033	13.401	.325	.347	1.515	45.02	8	4.937	41.153
12	12.75	12.	.375	40.055	37.7	127.677	113.098	14.579	.299	.319	1.273	48.985	8	5.875	48.972

Dimensions of Wrought Iron and Steel Pipe

EXTRA STRONG

DIAMETER			Thickness Inches	Nearest Wire Gauge Number	CIRCUMFERENCE		TRAVERSE AREAS			Length of Pipe per Square Foot of		Nominal Weight per Foot Pounds
Nominal Internal Inches	Actual External Inches	Actual Internal Inches			External Inches	Internal Inches	External Square Inches	Internal Square Inches	Metal Square Inches	External Surface Feet	Internal Surface Feet	
1/8	.405	.205	.1	12½	1.272	.644	.129	.033	.086	9.433	18.632	.29
1/4	.54	.294	.123	11	1.696	.924	.229	.068	.161	7.075	12.986	.54
3/8	.675	.421	.127	10½	2.121	1.323	.358	.139	.219	5.657	9.07	.74
1/2	.84	.542	.149	9	2.639	1.703	.554	.231	.323	4.547	7.046	1.09
3/4	1.05	.736	.157	8½	3.299	2.312	.866	.452	.414	3.637	5.109	1.39
1	1.315	.951	.182	7	4.131	2.988	1.358	.71	.648	2.904	4.016	2.17
1¼	1.66	1.272	.194	6½	5.215	3.996	2.164	1.271	.893	2.301	3.003	3.
1½	1.9	1.494	.203	6	5.969	4.694	2.835	1.753	1.082	2.01	2.556	3.63
2	2.375	1.933	.221	5	7.461	6.073	4.43	2.935	1.495	1.608	1.975	5.02
2½	2.875	2.315	.28	2	9.032	7.273	6.492	4.209	2.283	1.328	1.649	7.67
3	3.5	2.892	.304	1	10.996	9.085	9.621	6.569	3.052	1.091	1.328	10.25
3½	4.	3.358	.321	0	12.566	10.549	12.566	8.856	3.71	.955	1.137	12.47
4	4.5	3.818	.341	0	14.137	11.995	15.904	11.449	4.455	.849	1.	14.97
5	5.563	4.813	.375	00	17.477	15.120	24.306	18.193	6.12	.687	.793	20.54
6	6.625	5.75	.437	000	20.813	18.064	34.472	25.967	8.505	.577	.664	28.58

DOUBLE EXTRA STRONG PIPE

1/2	.84	.244	.298	1	2.639	.766	.554	.047	.507	4.547	15.667	1.7
3/4	1.05	.422	.314	1	3.299	1.326	.866	.139	.727	3.637	9.049	2.44
1	1.315	.587	.364	00	4.131	1.844	1.358	.271	1.087	2.904	6.508	3.65
1¼	1.66	.885	.388	00	5.215	2.78	2.164	.615	1.549	2.304	4.317	5.2
1½	1.9	1.088	.406	000	5.969	3.418	2.835	.93	1.905	2.01	3.511	6.4
2	2.375	1.491	.442	0000	7.461	4.684	4.43	1.744	2.686	1.608	2.561	9.02
2½	2.875	1.755	.560	9/16—	9.032	5.513	6.492	2.419	4.073	1.328	2.176	13.68
3	3.5	2.284	.608	5/8—	10.996	7.175	9.621	4.097	5.524	1.091	1.672	18.56
3½	4.	2.716	.642	5/8+	12.566	8.533	12.566	5.794	6.772	.955	1.406	22.75
4	4.5	3.136	.682	11/16—	14.137	9.852	15.904	7.724	8.18	.849	1.217	27.48
5	5.563	4.063	.75	3/4	17.477	12.764	24.306	12.965	11.34	.687	.940	38.12
6	6.625	4.875	.875	7/8	20.813	15.315	34.472	18.666	15.896	.577	.784	53.11

Table Showing Refrigerating Effect

of One Cubic Foot of Ammonia Gas at Different Condenser and Suction (Back) Pressures in B. T. Units

Temperature of Gas in Degrees F.	Corresponding Suction Pressure Pounds per Square Inch	Temperature of the Liquid in Degrees F. 65°	70°	75°	80°	85°	90°	95°	100°	105°
		Corresponding Condenser Pressure (gauge), Pounds per Square Inch 103	115	127	139	153	168	184	200	218
	G. Pres.									
—27	1	27.30	27.01	26.73	26.44	26.16	25.87	25.59	25.30	25.02
—20	4	33.74	33.40	33.04	32.70	32.34	31.99	31.64	31.30	30.94
—15	6	36.36	36.48	36.10	35.72	35.34	34.96	34.58	34.20	33.82
—10	9	42.28	41.84	41.41	40.97	40.54	40.10	39.67	39.23	38.80
— 5	13	48.31	47.81	47.32	46.82	46.33	45.83	45.34	44.84	44.35
0	16	54.88	54.32	53.76	53.20	52.64	52.08	51.52	50.96	50.40
5	20	61.50	60.87	60.25	59.62	59.00	58.37	57.75	57.12	56.50
10	24	68.66	67.97	67.27	66.58	65.88	65.19	64.49	63.80	63.10
15	28	75.88	75.12	74.35	73.59	72.82	72.06	71.29	70.53	69.76
20	33	85.15	84.30	83.44	82.59	81.73	80.88	80.02	79.17	78.31
25	39	95.50	94.54	93.59	92.63	91.68	90.72	89.97	88.81	87.86
30	45	106.21	105.15	104.09	103.03	101.97	100.91	99.85	98.79	97.73
35	51	115.69	114.54	123.39	112.24	111.09	109.94	108.79	107.64	106.49

Table Giving Number of Cubic Feet

of Gas that must be pumped per minute at Different Condenser and Suction Pressures to produce One Ton of Refrigeration in Twenty-Four Hours

Temperature of Gas in Degrees F.	Corresponding Suction Pressure Pounds per Square Inch	Temperature of the Gas in Degrees F. 65°	70°	75°	80°	85°	90°	95°	100°	105°
		Corresponding Condenser Pressure (gauge), Pounds per Square Inch 103	115	127	139	153	168	184	200	218
	G. Pres.									
—27	1	7.22	7.3	7.37	7.46	7.54	7.62	7.70	7.79	7.88
—20	4	5.84	5.9	5.96	6.03	6.09	6.16	6.23	6.30	6.43
—15	6	5.35	5.4	5.46	5.52	5.58	5.64	5.70	5.77	5.83
—10	9	4.66	4.73	4.76	4.81	4.86	4.91	4.97	5.05	5.08
— 5	13	4.09	4.12	4.17	4.21	4.25	4.30	4.35	4.40	4.44
0	16	3.59	3.63	3.66	3.70	3.74	3.78	3.83	3.87	3.91
5	20	3.20	3.24	3.27	3.30	3.34	3.38	3.41	3.45	3.49
10	24	2.87	2.9	2.93	2.96	2.99	3.02	3.06	3.09	3.12
15	28	2.59	2.61	2.65	2.68	2.71	2.73	2.76	2.80	2.82
20	33	2.31	2.34	2.36	2.38	2.41	2.44	2.46	2.49	2.51
25	39	2.06	2.08	2.10	2.12	2.15	2.17	2.20	2.22	2.24
30	45	1.85	1.87	1.89	1.91	1.93	1.95	1 97	2.00	2.01
35	51	1.70	1.72	1.74	1.76	1.77	1.79	1.81	1.83	1.85

Table of Chloride of Calcium Solution

Specific Gravity at 64 Degrees F.	Degree Beaume at 64 Degrees F.	Degree Salometer at 64 Degrees F.	Per Cent. of $CaCl_2$.	Freezing Point in Degrees F.	Ammonia Gauge Pressure Pounds per Square Inch
1.007	1	4	0.943	+31.20	46
1.014	2	8	1.886	+30.40	45
1.021	3	12	2.829	+29.60	44
1.028	4	16	3.772	+28.80	43
1.035	5	20	4.715	+28.00	42
1.043	6	24	5.658	+26.89	41
1.050	7	28	6.601	+25.78	40
1.058	8	32	7.544	+24.67	38
1.065	9	36	8.487	+23.56	37
1.073	10	40	9.430	+22.09	35.5
1.081	11	44	10.373	+20.62	34
1.089	12	48	11.316	+19.14	32.5
1.097	13	52	12.259	+17.67	30.5
1.105	14	56	13.202	+15.75	29
1.114	15	60	14.145	+13.82	27
1.112	16	64	15.088	+11.89	25
1.131	17	68	16.031	+ 9.96	23.5
1.140	18	72	16.974	+ 7.68	21.5
1.149	19	76	17.917	+ 5.40	20
1.158	20	80	18.860	+ 3.12	18
1.167	21	84	19.803	— 0.84	15
1.176	22	88	20.746	— 4.44	12.5
1.186	23	92	21.689	— 8.03	10.5
1.196	24	96	22.632	—11.63	8
1.205	25	100	23.575	—15.23	6
1.215	26	104	24.518	—19.56	4
1.225	27	108	25.461	—24.43	1.5
1.236	28	112	26.404	—29.29	1″ vacuum
1.246	29	116	27.347	—35.30	5″ vacuum
1.257	30	120	28.290	—41.32	8.5″ vacuum
1.268	31	.....	29.233	—47.66	12″ vacuum
1.279	32	.....	30.176	—54.00	15″ vacuum
1.290	33	.....	31.119	—44.32	10″ vacuum
1.302	34	.....	32.062	—34.66	4″ vacuum
1.313	35	.....	33.	—25.00	1.5 pounds

Table of Brine Solution

(Chloride of Sodium—Common Salts)

Percentage of Salt by Weight	Degrees on Salometer at 60 Degrees F.	Specific Gravity at 60 Degrees F.	Specific Heat	Weight of 1 Gallon	Pounds of Salt in 1 Gallon	Pounds of Water in 1 Gallon	Weight of 1 Cubic Foot	Pounds of Salt in 1 Cubic Foot	Pounds of Water in 1 Cubic Foot	Freezing Point Degrees F.
0	0	1.	1.	8.35	0.	8.35	62.4	0.	62.4	32.
1	4	1.007	0.992	8.4	0.084	8.316	62.8	0.628	62.172	31.8
5	20	1.037	0.96	8.65	0.432	8.218	64.7	3.237	61.465	25.4
10	40	1.073	0.892	8.95	0.895	8.055	66.95	6.695	60.253	18.6
15	60	1.115	0.855	9.3	1.395	7.905	69.57	10.435	59.134	12.2
20	80	1.150	0.829	9.6	1.92	7.68	71.76	14.352	57.408	6.86
25	100	1.191	0.783	9.94	2.485	7.455	74.26	18.565	55.695	1.00

Table of Comparative Capacities of Pipes of Standard Sizes

Showing the Number of Times the Area of One Pipe is Contained in that of a Larger

	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	7	8	9	10
$\frac{1}{8}$	1.																		
$\frac{1}{4}$	1.9	1.																	
$\frac{3}{8}$	3.3	1.8	1.																
$\frac{1}{2}$	5.3	2.9	1.5	1.															
$\frac{3}{4}$	9.3	5.2	2.7	1.7	1.														
1	14.7	7.7	4.1	2.6	1.6	1.													
$1\frac{1}{4}$	26.2	14.3	7.8	4.9	2.8	1.6	1.												
$1\frac{1}{2}$	35.6	19.5	10.6	6.6	3.8	2.4	1.3	1.											
2	58.6	32.2	17.5	11.0	6.9	3.9	2.2	1.6	1.										
$2\frac{1}{2}$	83.6	44.6	25.0	15.7	9.0	5.5	3.2	2.3	1.4	1.									
3	129.1	71.0	38.5	24.2	13.8	8.5	5.0	3.6	2.2	1.5	1.								
$3\frac{1}{2}$	172.8	95.0	51.6	32.4	18.5	11.4	6.6	4.8	2.9	2.0	1.3	1.							
4	222.5	122.3	66.4	41.7	23.8	14.7	8.5	6.2	3.8	2.6	1.7	1.3	1.						
5	349.4	192.0	104.3	65.6	37.4	23.1	13.3	9.8	5.9	4.1	2.7	2.0	1.5	1.					
6	505.0	277.5	150.7	94.7	54.1	33.4	19.3	14.1	8.6	6.0	3.9	2.9	2.2	1.4	1.				
7	677.2	372.1	202.2	127.0	71.3	44.9	25.9	19.0	11.5	8.1	5.2	3.9	3.0	1.9	1.3	1.			
8	878.3	480.7	261.2	164.1	93.8	58.0	34.5	24.5	14.9	10.4	6.7	5.0	3.9	2.5	1.7	1.3	1.		
9	1112.4	611.2	332.1	208.7	179.3	73.4	42.7	31.2	19.0	13.3	8.7	6.4	5.0	3.1	2.2	1.6	1.2	1.	
10	1378.3	757.3	411.5	258.6	147.8	91.3	52.7	38.6	23.5	16.5	10.6	7.9	6.2	3.9	2.7	2.0	1.5	1.2	1.

Areas of Circles Advancing by Eighths

Dia.	0	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
0	.0	.0122	.0490	.1104	.1963	.3068	.4417	.6013
1	.7854	.9940	1.227	1.484	1.767	2.073	2.405	2.761
2	3.1416	3.546	3.976	4.430	4.908	5.411	5.939	6.491
3	7.068	7.669	8.295	8.946	9.621	10.32	11.04	11.79
4	12.56	13.36	14.18	15.03	15.90	16.80	17.72	18.66
5	19.63	20.62	21.64	22.69	23.75	24.85	25.96	27.10
6	28.27	29.46	30.67	31.91	33.18	34.47	35.78	37.12
7	38.48	39.87	41.28	42.71	44.17	45.66	47.17	48.70
8	50.29	51.84	53.45	55.08	56.74	58.42	60.13	61.86
9	63.61	65.39	67.20	69.02	70.88	72.75	74.69	76.58
10	78.54	80.51	82.51	84.54	86.59	88.66	90.76	92.88
11	95.03	97.20	99.40	101.6	103.8	106.1	108.4	110.7
12	113.0	115.4	117.8	120.2	122.7	125.1	127.6	130.1
13	132.7	135.2	137.8	140.5	143.1	145.8	148.4	151.2
14	153.9	156.6	159.4	162.2	165.1	167.9	170.8	173.7
15	176.7	179.6	182.6	185.6	188.6	191.7	194.8	197.9
16	201.0	204.2	207.3	210.5	213.8	217.0	220.3	223.6
17	226.9	230.3	233.7	237.1	240.5	243.9	247.4	250.9
18	254.4	258.0	261.5	265.1	268.8	272.4	276.1	279.8
19	283.5	287.2	291.0	294.8	298.6	302.4	306.3	310.2
20	314.1	318.1	322.0	326.0	330.0	334.1	338.1	342.2
21	346.3	350.4	354.6	358.8	363.0	367.2	371.5	375.8
22	380.1	384.4	388.8	393.2	397.6	402.0	406.4	410.9
23	415.4	420.0	424.5	429.1	433.7	438.3	433.0	447.6
24	452.3	457.1	461.8	466.6	471.4	476.2	481.1	485.9
25	490.8	495.7	500.7	505.7	510.7	515.7	520.7	525.8
26	536.9	536.0	541.1	546.3	551.5	556.7	562.0	567.2
27	572.5	577.8	583.2	588.5	593.9	599.3	604.8	610.2
28	615.7	621.2	626.7	632.3	637.9	643.5	649.1	654.8
29	660.5	666.2	671.9	677.7	683.4	689.2	695.1	700.9
30	706.8	712.7	718.6	724.6	730.6	736.6	742.6	748.6
31	754.8	760.9	767.9	773.1	779.3	785.5	791.7	798.0
32	804.3	810.6	816.9	823.2	829.6	836.0	842.4	848.8
33	855.3	861.8	868.3	874.9	881.4	888.0	894.6	901.3
34	907.9	914.7	921.3	928.1	934.8	941.6	948.4	955.3
35	962.1	969.0	975.9	982.8	989.8	996.8	1003.8	1010.8
36	1017.9	1025.0	1032.1	1039.2	1046.3	1053.5	1060.7	1068.0
37	1075.2	1082.5	1089.8	1097.1	1104.5	1111.8	1119.2	1126.9
38	1134.1	1141.6	1149.1	1156.6	1164.2	1171.7	1179.3	1186.7
39	1194.6	1202.3	1210.0	1217.7	1225.4	1233.2	1241.0	1248.8
40	1256.6	1264.5	1272.4	1280.3	1288.2	1296.2	1304.2	1312.2
41	1320.3	1328.3	1336.4	1344.5	1352.7	1360.8	1369.0	1377.2
42	1385.4	1393.7	1402.0	1410.3	1418.6	1427.0	1435.4	1443.8
43	1452.2	1460.7	1469.1	1477.6	1486.2	1494.7	1503.3	1511.9
44	1520.5	1529.2	1537.9	1546.6	1555.3	1564.0	1572.8	1581.6
45	1590.4	1599.3	1608.2	1617.0	1626.0	1634.9	1643.9	1652.9

The area of a circle is equal to the square of the diameter multiplied by 0.7854.

The circumference of a circle is equal to the diameter multiplied by 3.1416.

Useful Numbers for Rapid Approximation

Feet	×	.00019	=miles
Yards	×	.0006	=miles
Links	×	.22	=yards
Links	×	.66	=feet
Feet	×	1.5	=links
Square inches	×	.007	=square feet
Circular inches	×	.00546	=square feet
Square feet	×	.111	=square yards
Acres	×	4840.	=square yards
Square yards	×	.0002066	=acres
Cubic feet	×	.04	=cubic yards
Cubic inches	×	.00058	=cubic feet
U. S. bushels	×	.046	=cubic yards
U. S. bushels	×	1.244	=cubic feet
U. S. bushels	×	2150.42	=cubic inches
Cubic feet	×	.8036	=U. S. bushels
Cubic inches	×	.000466	=U. S. bushels
U. S. gallons	×	.13368	=cubic feet
U. S. gallons	×	231.	=cubic inches
Cubic feet	×	7.48	=U. S. gallons
Cylindrical feet	×	5.878	=U. S. gallons
Cubic inches	×	.004329	=U. S. gallons
Cylindrical inches	×	.0034	=U. S. gallons
Pounds	×	.009	=cwt. (112 lbs.)
Pounds	×	.00045	=tons (2,240 lbs.)
Cubic feet water	×	62.5	=lbs. avdps.
Cubic inches water	×	.03617	=lbs. avdps.
Cylindrical feet of water	×	49.1	=lbs. avdps.
Cylindrical inches of water	×	.02842	=lbs. avdps.
U. S. gallons of water	÷	13.44	=cwt. (112 lbs.)
U. S. gallons of water	÷	268.8	=tons
Cubic feet water	÷	1.8	=cwt. (112 lbs.)
Cubic feet water	÷	35.88	=tons
Cylindrical feet of water	÷	5.875	=U. S. gallons
Column of water 12 in. high, 1 in. diam			=.34 lbs.
183.346 circular inches			=1 square foot
2,200 cylindrical inches			=1 cubic foot
French meters	×	3.281	=feet
Kilogrammes	×	2.205	=avdps. lbs.
Grammes	×	.0022	=avdps. lbs.

12 ×weight of pine pattern=iron casting
13 ×weight of pine pattern=brass casting
19 ×weight of pine pattern=lead casting
12.2×weight of pine pattern=tin casting
11.4×weight of pine pattern=zinc casting
1 cubic foot anthracite coal=54 lbs.
40–43 cu. ft. anthracite coal=1 ton
49 cubic feet bituminous coal=1 ton

537 lbs. per cu. ft.=weight of copper
450 lbs. per cu. ft.=weight of cast iron
485 lbs. per cu. ft.=weight of wrought iron
708 lbs. per cu. ft.=weight of cast lead
490 lbs. per cu. ft.=weight of steel
1 gal water=8⅓ lbs.=231 cu. in.
1 cu. ft. water=62½ lbs.=7½ gals.
1 lb. water=27.8 cu. in.=1 pint

The friction of water in pipes is as the square of its velocity.
Doubling the diameter of a pipe increases
its capacity four times.

Horse Power Transmitted by Leather Belts

SINGLE

Speed in Feet per Minute	WIDTH OF BELTS IN INCHES											
	2	3	4	5	6	8	10	12	14	16	18	20
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
400	1	1½	2	2½	3	4	5	6	7	8	9	10
600	1½	2¼	3	3¾	4½	6	7½	9	10½	12	13½	15
800	2	3	4	5	6	8	10	12	14	16	18	20
1000	2½	3¾	5	6¼	7½	10	12½	15	17½	20	22½	25
1200	3	4½	6	7½	9	12	15	18	21	24	27	30
1500	3¾	5¾	7½	9½	11½	15	18¾	22½	26½	30	33¾	37½
1800	4½	6¾	9	11¼	13½	18	22½	27	31½	36	40½	45
2000	5	7½	10	12½	15	20	25	30	35	40	45	50
2400	6	9	12	15	18	24	30	36	42	48	54	60
2800	7	10½	14	17½	21	28	35	42	49	56	63	70
3000	7½	11¼	15	18¾	22½	30	37½	45	52½	60	67½	75
3500	8¾	13	17½	22	26	35	44	52½	61	70	79	88
4000	10	15	20	25	30	40	50	60	70	80	90	100
4500	11¼	17	22½	28	34	45	57	69	78	90	102	114
5000	12½	19	25	31	37½	50	62½	75	87½	100	112	125

Belts supposed to be not overstrained, so they will last.
1-inch wide, 800 feet per minute=1 Horse Power.

DOUBLE

Speed in Feet per Minute	WIDTH OF BELTS IN INCHES												
	4	6	8	10	12	14	16	18	20	22	24	28	30
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
400	2¾	4¼	5¾	7¼	8½	10	11½	13	14½	16	17½	20	21½
600	4¼	6½	8¾	11	13	15	17½	19½	22	24	26	30½	32½
800	5¾	8½	11½	14½	17½	20½	23	26	29	32	34½	40½	43½
1000	7¼	11	14½	18¼	21½	25½	29	32½	36	40	43½	51	54½
1200	8½	13	17½	22	26	30½	34¼	39	44	48	52½	60½	65
1500	10¾	16¼	21¾	27¼	32½	38	43½	49	54½	60	65½	76½	81½
1800	13	19½	26	32¾	39	45½	52	59	65½	72	78½	91½	98
2000	14½	21¾	29	36½	43½	50½	58	65½	72½	80	87	102	109
2400	17¼	26	34¾	44	52½	60½	69½	78¼	88	96	105	122	131
2800	20¼	30½	40½	51	61	71	81	91½	102	112	122	142	153
3000	21½	32½	43½	54½	65½	76	87½	98	108	120	131	153	163
3500	25½	38	50¾	63½	76	89	101	114	127	140	153	178	191
4000	29	43½	58¼	72¾	87	101	116	131	145	160	174	204	218
4500	32½	49	65	82	98	114	131	147	163	180	196	229	245
5000	36½	54½	72¾	91	109	127	145	163	182	200	218	254	272

1-inch wide, 550 feet per minute=1 Horse Power.

Horsepower
Turned Steel Shafting For Line Shaft Service
Bearings Eight Feet Apart

Formula: H. P.=horsepower; D=diameter of shaft in inches; R=revolutions per minute.

$$\text{H. P.} = \frac{D^3 R}{90}$$

Size Shaft Inches	REVOLUTIONS PER MINUTE									
	100	125	150	175	200	225	250	300	350	400
1 3/16	2.1	2.6	3.2	3.7	4.2	4.7	5.3	6.3	7.4	8.4
1 7/16	3.7	4.6	5.6	6.5	7.4	8.3	9.3	11.1	13.0	14.8
1 11/16	5.3	6.7	8.0	9.3	10.7	12.0	13.4	16	18.7	21
1 15/16	8.1	10.0	12.1	14.1	16.1	18.2	20	24	28	32
2 3/16	11.6	14.6	17.5	20	23	26	29	35	41	47
2 7/16	16	20	24	28	32	36	40	48	56	64
2 11/16	21	27	32	38	43	48	54	65	76	86
2 15/16	28	35	42	49	56	63	70	84	99	113
3 3/16	36	45	54	63	72	81	90	108	126	144
3 7/16	45	56	68	79	90	102	113	135	158	181
3 11/16	56	70	83	98	111	125	139	167	195	223
3 15/16	68	85	102	118	135	152	169	203	237	271
4 7/16	97	122	146	171	193	219	243	292	341	390
4 15/16	134	168	201	235	268	302	336	402	470	537
5 7/16	184	230	277	322	369	415	461	553	645	738
6	240	300	360	419	480	540	600	720	840	960
6 7/16	305	382	459	535	611	687	764	917	1069	1222
7	381	476	573	667	762	857	953	1143	1333	1524
7 1/2	468	586	704	822	938	1055	1173	1406	1641	1875
8	568	712	855	998	1138	1280	1423	1707	1991	2275
8 1/2	681	853	1025	1197	1364	1535	1707	2047	2387	2728
9	809	1013	1217	1421	1620	1822	2027	2430	2834	3240
9 1/2	951	1191	1431	1671	1904	2142	2382	2858	3334	3808
10	1111	1388	1666	1944	2222	2500	2778	3333	3888	

Head Shaft Service

For head and jack shafts, supported by bearings close to the main sheave or pulley, so as to prevent transverse strain, the following formula may be used with safety:

H. P.=horsepower; D=diameter of shaft in inches; R=revolutions per minute.

$$\text{H. P.} = \frac{D^3 R}{125}$$

Comparison of Thermometers

Cent.	Réau.	Fahr.	Cent.	Réau.	Fahr.	Cent.	Réau.	Fahr.
—40	—32.0	—40.0	21	16.8	69.8	62	49.6	143.6
—38	—30 4	—36.4	22	17.6	71.6	63	50.4	145.4
—36	—28.8	—32.8	23	18.4	73.4	64	51.2	147.2
—34	—27.2	—29.2	24	19.2	75.2	65	52.0	149.0
—32	—25.6	—25.6	25	20.0	77.0	66	52.8	150.8
—30	—24.0	—22.0	26	20.8	78.8	67	53.6	152.6
—28	—22.4	—18.4	27	21.6	80.6	68	54.4	154.4
—26	—20.8	—14.8	28	22.4	82.4	69	55.2	156.2
—24	—19.2	—11.2	29	23.2	84.2	70	56.0	158.0
—22	—17.6	— 7.6	30	24.0	86.0	71	56.8	159.8
—20	—16.0	— 4.0	31	24.8	87.8	72	57.6	161.6
—18	—14.4	— 0.4	32	25.6	89.6	73	58.4	163.4
—16	—12.8	+ 3.2	33	26.4	91.4	74	59.2	165.2
—14	—11.2	6.8	34	27.2	93.2	75	60.0	167.0
—12	— 9.6	10.4	35	28.0	95.0	76	60.8	168.8
—10	— 8.0	14.0	36	28.8	96.8	77	61.6	170.6
— 8	— 6.4	17.6	37	29.6	98.6	78	62.4	172.4
— 6	— 4.8	21.2	38	30.4	100.4	79	63.2	174.2
— 4	— 3.2	24.8	39	31.2	102.2	80	64.0	176.0
— 2	— 1.6	28.4	40	32.0	104.0	81	64.8	177.8
0	0.0	32.0	41	32.8	105.8	82	65.6	179.6
+ 1	+ 0.8	33.8	42	33.6	107.6	83	66.4	181.4
2	1.6	35.6	43	34.4	109.4	84	67.2	183.2
3	2.4	37.4	44	35.2	111.2	85	68.0	185.0
4	3.2	39.2	45	36.0	113.0	86	68.8	186.8
5	4.0	41.0	46	36.8	114.8	87	69.6	188.6
6	4.8	42.8	47	37.6	116.6	88	70.4	190.4
7	5.6	44.6	48	38.4	118.4	89	71.2	192.2
8	6.4	46.4	49	39.2	120.2	90	72.0	194.0
9	7.2	48.2	50	40.0	122.0	91	72.8	195.8
10	8.0	50.0	51	40.8	123.8	92	73.6	197.6
11	8.8	51.8	52	41.6	125.6	93	74.4	199.4
12	9.6	53.6	53	42.4	127.4	94	75.2	201.2
13	10.4	55.5	54	43.2	129.2	95	76.0	203.0
14	11.2	57.2	55	44.0	131.0	96	76.8	204.8
15	12.0	59.0	56	44.8	132.8	97	77.6	206.6
16	12.8	60.8	57	45.6	134.6	98	78.4	208.4
17	13.6	62.6	58	46.4	136.4	99	79.2	210.2
18	14.4	64.4	59	47.2	138.2	100	80.0	212.0
19	15.2	66.2	60	48.0	140.0			
20	16.0	68.0	61	48.8	141.8			

Fahr.=32+$\frac{9}{5}$ Cent.=32+$\frac{9}{4}$ Réau.

Freezing point on Fahrenheit scale is+32 degrees; boiling point, 212 degrees.
Freezing point on Centigrade scale is+0 degrees; boiling point, 100 degrees.
Freezing point on Réaumur scale is+0 degrees; boiling point, 80 degrees.
Of water at sea level at normal barometer pressure (29.9 inch).

The "absolute zero" of temperature denotes that condition of matter at which heat ceases to exist. At this point a body would be wholly deprived of heat and a gas would exert no pressure.

The absolute zero on the Fahrenheit scale is about 461 degrees below zero.
The absolute zero on the Centigrade scale is about 274 degrees below zero.
The absolute zero on the Réaumur scale is about 219 degrees below zero.

An English unit of heat (B. T. U.) is the quantity required to raise one pound of water one degree Fahrenheit. A metric unit of heat or metric caloric (M. C.) is the quantity of heat required to raise one litre of water one degree centigrade.

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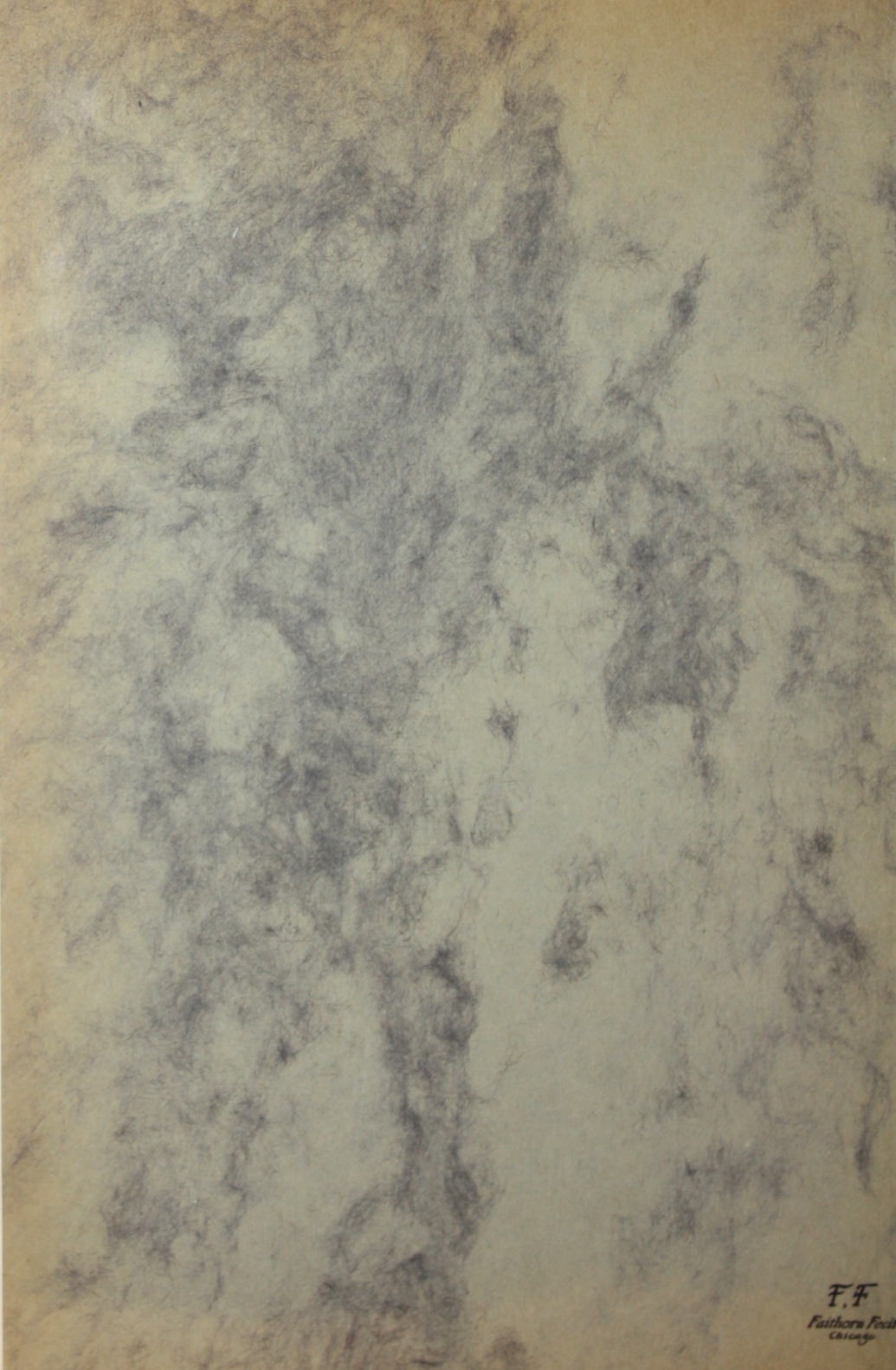
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